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ADDRESSES AND ORIGINAL ARTICLES

CARDIOVASCULAR SYPHILIS *

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IT is not the purpose of this paper to deal with the pathological aspects of cardiovascular syphilis, but rather to emphasise the clinical features of a protean disease. This may, perhaps, best be secured by describing separately the recognised types.

Aortitis as the precursor of aneurysm and of syphilitic aortic regurgitation is of paramount importance, and its early recognition might do much to avoid its serious sequelæ. Yet when we inquire how such a diagnosis may be made we are confronted with great but not unexpected difficulties, for the microscopical changes are well advanced before any detectable anatomical disturbances take place. Certain symptoms and signs, however, when found in combination may be sufficient to warrant a diagnosis. In the absence of gross arterio-sclerosis and arterial hypertension, accentuation of and particularly a metallic ringing quality of the second aortic sound is often regarded as a suggestive sign, though it is so common in persons over 50 that due care must be taken in appraising its value as a sign of aortitis. By contrast, a diminution in the intensity of the second aortic sound may be an early indication of an aortic leak, though such a diagnosis cannot, of course, be established on this sign alone.

Systolic murmurs over the aortic area are of doubtful significance, but some regard them as significant when found in conjunction with other signs of aortitis. Possibly percussion may reveal a little increase in the aortic dullness. These signs may be accompanied by symptoms such as pain and breathlessness, and the latter is often nocturnal. It is natural that as the diagnosis rests on such equivocal signs as these, some more decisive method should be sought.

Radiological examinations, both by teleradiogram and screening, have been found of considerable service in skilled hands, though diagnosis of aortitis with X rays is not possible unless other physical signs support it. Thus, whilst Kurtz and Eyster [1] found fluoroscopic evidence of aortitis in 90 per cent. of cases of acquired syphilis, Ingraham and Maynard [2] found no such evidence in early syphilis, and Bach and Worster-Drought [3] in only 2 out of 25 cases of neurosyphilis.

The radiological criteria of a pathological aorta as given by David Steel [4] are as follows: (1) a dense shadow with a hazy border; (2) a high, dense, prominent aortic knob; (3) irregular and also general dilatation—the most important sign; (4) increased pulsation. Other writers in general agree with this statement, but much difference of opinion exists as to the accuracy of diagnosis based upon radiological methods. All are agreed that the facts must be pieced carefully together, and may under certain circumstances justify a grave suspicion of aortitis. Even then the specific nature of the lesion does not follow, and arterio-sclerotic forms of aortitis may be mistaken for those due to syphilis.

In making a differential diagnosis, a positive Wassermann reaction is of moment and may be called forth by a provocative dose of organic arsenic, but is by no means conclusive of the syphilitic nature of the disease. Search should be made for other signs of syphilis, for example, of the nervous system or viscera, and the past history of the patient must be considered. Any suspicion of aneurysmal dilatation is much in favour of syphilis, whilst aortic leakage in the absence of a rheumatic history and particularly in persons over 35 is nearly always syphilitic.

Aneurysm, the direct sequel of aortitis, needs little discussion in this paper, for its diagnosis is sufficiently familiar and its syphilitic origin universally admitted.

AORTIC REGURGITATION

Another sequel of syphilitic aortitis deserves attention in view of the occasional difficulty in separating syphilitic cases from those due to rheumatism and other causes. Aortic leakage is sometimes found in old age associated with arterio-sclerotic dilatation of the aorta, but cases of this type are rare and can be dismissed here. Another cause of aortic incompetence sometimes overlooked in differential diagnosis is infective endocarditis, especially in its subacute form. If systematic search is made in all valvular lesions for pyrexia, enlargement of the spleen, petechiæ, clubbing of the fingers, hæmaturia, and other signs of systemic infection this possibility will not escape the observer. Rupture of the aortic cusps is an unusual cause of incompetence with a characteristic history of severe trauma.

When these rare causes have been excluded the diagnosis as a rule rests between aortic regurgitation of rheumatic and of syphilitic origin. In distinguishing these, age is of first importance—the rheumatic type generally occurring in children and young adults, the syphilitic in middle age. Rheumatic cases may not, of course, be recognised until mid-life, especially when the damage to the valves has been limited and non-progressive. The history, though at times conclusive, is frequently of little value, for it is well known that mild forms of rheumatism may escape notice, while a history of syphilis is often concealed. The coincidence of mitral valve defects is generally in favour of a rheumatic origin for the aortic disease, but the presence of an Austin Flint presystolic murmur at the mitral area may lead to difficulty. Clinical or radiological evidence of enlargement of the left auricle suggests mitral disease, as may right ventricular preponderance and increase in the amplitude and duration of the P-waves in the electrocardiogram.

MYOCARDIAL LESIONS

The frequency with which syphilis attacks the myocardium is much in dispute. On clinical grounds the diagnosis of syphilitic myocarditis has always proved difficult, and certain pathologists claim that it occurs with much greater frequency than would appear from observations in the wards. Warthin [5] in particular emphasised its great frequency. He found what he considered to be evidence of syphilitic myocarditis, sometimes slight, sometimes great, in every male patient with latent syphilis. In females the incidence was much less. Warthin described microscopic features which he considered pathognomonic of syphilitic myocarditis, and in many cases was able to demonstrate the presence of spirochætes. His views, therefore, cannot be dismissed lightly.

* A paper read before the Liverpool Medical Institution, March 16th, 1933.

Unfortunately, however, other investigators have been unable to confirm his observations.

Clawson and Bell,[6] for example, after examining 126 cases of syphilitic aortitis, found that the myocardial changes were such that in most cases they could be accounted for by a mild non-specific coronary disease. Again, Martland [7] states that specific lesions of the myocardium and of the coronary arteries beyond the aortic wall are infrequent and usually so slight as to be unimportant. In spite of these conflicting statements, the majority of workers would agree that myocardial involvement is by no means rare in cardiovascular syphilis. Such involvement might be brought about by direct invasion of the myocardium with the *Spirochæta pallida* or its toxins, at a stage of the disease which will be discussed subsequently, or it might be due to specific changes in the coronary arteries due to extension from a syphilitic aorta. Coronary disease of this kind would inevitably impair the blood-supply to the myocardium.

In establishing a diagnosis of syphilitic myocarditis no single physical sign must be given undue prominence. This platitude deserves emphasis in all types of myocardial lesion. Some authorities consider that idiopathic hypertrophy of the heart (Carter and Baker [8]; Martland [7]) is suggestive of a syphilitic origin, and most would agree that when the hypertrophy is found without valvular disease, arterial hypertension, or arterio-sclerosis, syphilis should be considered seriously as the cause. Especially is this the case in middle-aged persons in whom a rheumatic origin is unlikely. In a series of 232 cases of syphilis examined by Chamberlain and Follows, 11 were found by palpation and percussion to have cardiac hypertrophy with no other abnormal signs, and several of these were young persons.

The symptomatology of syphilitic myocarditis is not pathognomonic; breathlessness, palpitations, precordial pain, and other features being common to all types of myocardial lesions. Some have stressed the occurrence of breathlessness and pain at night, but I have been unable to satisfy myself that this is a genuine point of difference between syphilitic and other heart lesions. On the other hand, certain negative features may prove of value in distinguishing syphilitic from other forms of myocardial lesion. Auricular fibrillation or other irregularities rarely occur as a result of syphilis. Coronary infarction is more frequently associated with arterio-sclerotic than with syphilitic changes in the coronary arteries, and its occurrence is against a diagnosis of syphilis.

The Wassermann test is, of course, most necessary and very valuable if allowance is made for the high incidence of a positive reaction amongst a population who may develop heart disease of non-specific origin. Moreover, true cases of cardiovascular syphilis undoubtedly occur with a negative Wassermann reaction. In the latter group, a provocative dose of neokharsivan may produce a conclusive response.

Finally, the electrocardiograph may assist in the diagnosis of myocarditis, but does *not* (as stated by some workers) give any clue to the syphilitic nature of the disease. The electrocardiogram may reveal unsuspected myocardial disease by the presence of abnormal T-waves, bundle-branch block, and delayed conductivity in the bundle of His. In the 232 cases examined by Chamberlain and Follows, of whom 221 were electrocardiographed, gross electrocardiographic defects were found in six cases, and minor but suspicious defects in a further seven. These results included cases of T-wave negativity and partial bundle-branch block, and with a few exceptions there was no clinical evidence of cardiovascular disease. Clinical defects without electrocardiographic abnormality were present in the 11 cases of cardiac hypertrophy previously mentioned, and in three cases of aortic regurgitation, two of whom showed a normal electrocardiogram. The results of the investigation emphasise the importance of combined clinical and electrocardiographic examination in investigations of this type.

STAGE OF INVASION IN CARDIAC SYPHILIS

The view of Warthin, that the spirochæte invades the myocardium and aorta during the stage of bacteræmia—i.e., in the secondary stage of syphilis—would lead one to expect changes in the heart and aorta in this phase of the disease, for the spirochæte is capable of producing an intense reaction in the tissues it invades. Yet the number of recorded cases of cardiovascular disease in the secondary stage is small, and many authorities cast doubt upon them.

The general consensus of opinion supports the view that after the secondary stage the spirochæte lies latent in the body for 15–25 years before attacking the cardiovascular and other tissues. In this dormant period little is known of its activities, but there is much to suggest that its resting place is in the mediastinal glands, from which at a favourable time it may gain ready access to the heart and aorta. This "lymphogenous" theory was convincingly put forward by Carey Coombs [9] and was based on the observations of Klotz,[10] Martland,[7] and others.

Whilst common experience dictates that heart disease does not occur until 15–25 years after the primary syphilitic infection, there are undoubtedly many cases which arise within a shorter interval. The recognition of these is of great importance, for in younger persons their course may be more rapid but more amenable to treatment. For their detection all methods of examination—clinical, electrocardiographic, and radiological—may be necessary.

COURSE AND TREATMENT OF CARDIAC SYPHILIS

The outlook in clinically recognisable cardiovascular syphilis is unfavourable, most cases following a progressively downward course. Willius [11] found that the duration of cases of syphilitic aortitis and aortic regurgitation averaged 23 years from the occurrence of primary syphilis, aneurysm averaging 26 years. The greater part of this period would be occupied by the so-called "latent" period, in which no symptoms are manifest and in which the disease is usually undetectable. In some cases the electrocardiograph or X ray might demonstrate suspicious changes while the patient was still symptomless, and in this type of case a repetition of antisyphilitic treatment might stay the advance of the visceral changes.

Even when cardiovascular syphilis is clinically apparent, a course of suitable treatment may modify the gloomy prognosis. The work of Moore and Danglade [12] suggests that life may be prolonged from 9 to 69 months in aneurysm, and in aortic regurgitation from 32 to 65 months.

The manner in which death is brought about by cardiovascular syphilis is variable and presents few characteristic features. In aortic regurgitation death may occur from gradual congestive heart failure or suddenly from defective filling of the coronary vessels. Syphilitic heart disease as a cause of sudden death is emphasised on clinical grounds by Martland [7] and on pathological grounds by Warthin.[13] The latter states that "it occurred five times more frequently in syphilitic than in non-syphilitic autopsies."

The treatment of cardiovascular syphilis has always been a vexed problem. Some have advocated heroic antisyphilitic measures irrespective of the type and grade of the cardiac lesion; others have held with depressing fatalism that treatment has no effect whatsoever. Even of the time-honoured administration of iodides a German cynic writes:

> "Wenn mann nicht weiss wo, wann, warum
> Denn gibt man Iodkalium."

The indiscriminate treatment of all cases of cardiac syphilis, especially with arsenicals, cannot be too strongly condemned. It is well known that an aggravation of local symptoms, called the Herxheimer reaction, may take place after intensive administration of antisyphilitic remedies, especially arsenic preparations, but may be prevented by careful alternation between heavy metals—i.e., mercury or bismuth, and arsenicals. Similarly a therapeutic paradox has been described by Wile [14] relating specially to the cardiovascular system. In this there is a remarkable improvement in the patient's general condition after the administration of arsenicals, shortly followed by aggravation of the local cardiac symptoms. The explanation of this phenomenon is uncertain, but it has been suggested that the syphilitic products may be too rapidly replaced by scar tissue, or that their disintegration produces chemical substances with a deleterious influence on the local lesion. If accidents in therapy are to be eliminated cases must be selected with care, and treatment must be cautious.

With these reservations there is every reason to believe that treatment may be of value not only in relief of symptoms but in the prolongation of life. In choosing suitable cases, one of the guiding principles should be the state of the cardiac reserve. Cases of decompensation with œdema, enlarged liver, or other congestive signs require restoration of compensation by the usual remedies, such as digitalis and rest, before any antispecific treatment can be carried out with safety. When compensation is good or has been restored by treatment, the patient may commence antisyphilitic measures. A good rule is to begin with iodides and mercury or bismuth, and note the response before using arsenic. Treatment with iodides and the heavy metals may be continued for 6–12 weeks before any arsenic is given.

Although it is difficult, without a large number of cases, to compare the effects of one drug with another, I have gained the general impression that bismuth gives better results than mercury in cardiovascular syphilis, especially when pain is a prominent symptom. It may be given in initial doses of 0·1 g., usually contained in 0·5 c.cm. of one of the suspended preparations, such as Bismostab, and the dose increased to 0·2 g. after three or four weeks. Six to eight weekly injections should be given. If the patient shows sufficient response to these lines of treatment, small doses of arsenic may next be given. Various preparations are recommended. Kharsulphan and Neokharsivan are reliable preparations, but should be given in small initial doses, say of 0·1 g., and gradually increased over a course of ten to twelve weeks. American workers recommend Neoarsphenamine or Bismarsen in similar doses.

In aortitis the same principles may be adopted—viz., preliminary iodides and a heavy metal, followed by cautious arsenic administration, but here the preparation of most value appears to be Tryparsamide, given in doses of 0·5 g. increasing to 1·0 g.

Adverse symptoms such as the Herxheimer reaction and Wile's therapeutic paradox are indications for the discontinuance of arsenicals and reliance must then be placed on careful use of bismuth and iodides. It is still uncertain whether specific measures prevent the progress of early syphilitic lesions such as aortitis and myocarditis, but as there is some evidence in favour of this it seems only right that the patient should have the benefit of full treatment, repeated at necessary intervals. When gross structural changes have occurred, as in aneurysm or grave aortic incompetence, the most that can be hoped for is arrest in the progress of the disease and relief of symptoms, and these cases above all require careful handling, usually responding better to iodides and bismuth than to arsenicals.

If there is a probability of gummatous collections in the heart, involving, for example, the bundle of His or its branches, fuller doses of iodides—grs. 60–120 daily—may be worth a trial. It is well known that large doses of iodides are also of value in relieving the pain of syphilitic aortitis and aneurysm.

Arsenicals should be prohibited in advanced cases of aortic disease and aneurysm, and in patients showing evidence of serious coronary disease generally detected by electrocardiographic means. Bismuth, mercury, and iodides are rarely dangerous, but even they require gentle administration, and should be discontinued if the results are obviously adverse.

In conclusion, I should like to express my thanks to Dr. A. A. Fitch and Dr. A. O. F. Ross, who have given me free access to their clinics and much valuable help.

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DEVELOPMENTS AT HARROGATE.—On Saturday, June 17th, Lord Horder opened the new sun colonnade which is the latest amenity at Harrogate. Speaking of British health resorts in general, he said that "we are only now beginning to appreciate the possibilities offered by the medicinal waters of our own country," but "in the matter of spa treatment, at any rate, the facilities at our disposal are as good in Great Britain as they are abroad." Given the energetic and intelligent coöperation of the doctors, the municipal authorities, and the town, he said, there was no reason whatever why British spas should not be as successful and as popular as their continental rivals. But success here, as in all other matters, presupposed courage, foresight, and intelligence. The people of Harrogate had been wise, he thought, in their latest attempt to bring the human gifts of design and adaptation to bear upon natural beauty, and the new promenade was only the first part of a large and necessary scheme to improve the facilities offered. The colonnade or sun walk is 600 feet long, is roofed with vita glass, and broadens into bays at two points, terminating in a café and concert hall. The next part of the scheme is the erection of a new pump-room, whose eventual cost will be £60,000.

RADIATION TREATMENT OF CANCER OF THE MOUTH AND PHARYNX*

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(WITH COLOURED PLATE)

AT the outset it must be made clear that radiation is not to be regarded as a method in opposition to the older established surgical procedures—it may be the essence of modern treatment but not to the exclusion of certain operative procedures, be these only accessory for drainage and approach or major operations for the removal of residual growths or lymphatic glands. It is also necessary to note that some of the failures in radium therapy need not be blamed on the agent itself but on the operator who fails to take advantage of up-to-date methods, who uses radium very occasionally, who has only a vague idea of dosage, intensity, and biological effects, and to whom the natural history of the disease is a closed book.

Radiosensitivity in Relation to Histological Structures

Until the clinician can define dosage in units of radiation energy delivered within the tumour, the term "radiosensitivity" remains indefinite and is only an expression of comparative values. Different histological types require different tissue doses to produce retrogression and disappearance of the tumour. From a study of the various publications of Martin and Quimby,[1 2 12] Cutler,[3 4] Regaud,[5] Ewing,[6 7] Broders,[8] and Phillips,[11] it is possible to classify the various types in the following three main groups[9]: (1) squamous-celled carcinoma with cell nests, (2) transitional cell carcinoma without cell nests, (3) lympho-carcinoma.

From a study of my own cases and the correlation of results obtained from various methods of irradiation I have arrived at the following conclusions, some of which confirm observations made by other workers:—

1. Histologically similar tumours present wide differences in their response to radiation—there must therefore be other factors besides actual structure as seen under the microscope which affect the response of tumour cells to radiation.

2. The condition of the stroma is as important as that of the nature of the cells.

3. Anatomical situation has a definite relation to radiosensitivity, irrespective of histological structure.

4. Radiosensitivity bears a direct relation to the local lymphatic and blood-supply; this has been experimentally confirmed by Mottram[33] and others.

5. Sepsis increases radio-resistance.

6. Anæmia, other factors being equal, increases radio-resistance.

From these conclusions it follows that the choice of treatment depends upon (1) the site and extent of the disease, (2) the type of lesion, (3) the general condition of the stroma or tumour bed, (4) the general condition of the patient.

It is now an accepted fact, which is borne out by the statistical survey of cases (see below), that in cancer of the mouth and pharynx radiation has proved of value, and that surgical excision no longer represents either the sole legitimate treatment or even the first treatment to be adopted.

Lesions in Various Sites

I propose to deal separately with lesions of the tongue, the cervical lymphatic area, the oropharynx, hypopharynx, and the maxillary antrum.

TONGUE

It matters little, perhaps, in the very early case, where the growth is in the *anterior part* of the tongue, whether local excision be employed or irradiation. The operative procedure is a minor one, function is not greatly interfered with, and the ultimate results, as far as the tongue is concerned, offer about an equal chance of local recurrence. This does not mean in any way that early lesions of the tongue do not respond to irradiation—they do—and the earlier the case the better the ultimate prognosis.

Lane-Claypon,[13] in the Ministry of Health report on cancer of the tongue (1930), states that from the massed material collected by her it appears that 20–25 per cent. of all patients operated upon are alive three years from operation, as compared to 37·8 per cent. of three years survival after radium treatment. It will be shown that by more modern methods in operable cases this survival-rate reaches a much higher figure (59·1 per cent. in Berven's cases[13]). It can therefore be said that surgery presents a fair claim in the treatment of early operable cases of the anterior part of the tongue. I would go further and say that it is much better for the patient to submit to competent surgery than to incompetent radiation, and that a proper radium treatment requires infinitely more care, skill, and specialised knowledge than that possessed by the average surgeon occasionally using radium.

FIG. 1.—Diagram showing extent of lesion as visualised from behind.

When the disease is situated behind the circumvalate papillæ, in the *posterior part* of the tongue, it is for all practical purposes beyond surgical help; here the choice must of necessity fall upon radiation as the first and best method of treatment, and the reasons for this preference are threefold: (1) the disease is not accessible to excision without grave risks to the patient; (2) the malignancy of tumours of the posterior group is of a very high order; (3) dissemination is early and widespread—it is therefore beyond the scope of excision. The results by radiation, however, are good, and many cases which appear hopeless to the excisional surgeon survive periods of three, five, and eight years following irradiation.

The *palate*, *buccal mucosa*, and *floor of the mouth* present a problem less complex. Irradiation can be carried out with comparative ease, and the immediate results are at least as good as those of surgery in

* A Hunterian lecture delivered at the Royal College of Surgeons of England on Feb. 8th, 1933.

operable cases and greatly superior in inoperable cases.

CASE 22.—Male, aged 50 years, under the care of Mr. William Turner at Westminster Hospital. Epithelioma of buccal mucosa near the angle of the mouth: no palpable cervical glands. Interstitial irradiation by means of eight needles of 0·6 mg. of radium element (R.E.) each, left in position seven days, followed by surface application on wax for three days. Total dose 1200 mg. hours. Complete disappearance of growth. Well five years.

FIG. 2.—Advanced sarcoma of left upper jaw, two years after treatment. No evidence of disease.

CASE 535.—Male, aged 66 years, under the care of Sir Cuthbert Wallace at Mount Vernon Hospital. Extensive and inoperable epithelioma of the right cheek which had involved the jaw, perforated through the skin, and formed numerous sinuses. Histology: squamous-celled carcinoma. Treated by interstitial irradiation in two stages. First the inside of the cheek was needled by ten needles at 0·6 mg. R.E. each and four needles at 1 mg. R.E. each. Total dose in seven days 1680 mg., followed by immediate needling of the skin of the face by ten needles at 2 mg. R.E. each and nine needles at 1 mg. each. Total in seven days 4704 mg. hours. By this method the tumour was irradiated from both aspects during 14 days. Total in 14 days 6384 mg. hours. Healing was slow, but by the end of the fifth month after treatment the whole ulcer, both inside the mouth and on the face, had completely cicatrised and the sinuses had healed. Well to date, two years.

CERVICAL LYMPHATIC AREA

From the very advent of radium treatment of oral and pharyngeal cancer it was obvious that the real difficulty was the prevention of cervical metastases and the treatment of the lymphatic area. From a critical study of the after-histories of patients treated by radium and after discussion of this question with Lacassagne, Quick, and Berven I believe that it can be accepted as axiomatic that treatment of the cervical area is imperative even when the neck appears entirely normal and the lesion in the mouth a very early one. To leave the neck untreated and to await developments is to court disaster; the time at which metastases appear cannot be either assessed or predicted. No matter how great one's clinical experience it is impossible to dogmatise on the state of the glands by clinical examination alone in early cases. It is therefore imperative to treat the cervical area. Sir Cuthbert Wallace [15] in his statistical report on the work of Mount Vernon Hospital, issued in May, 1932, presents our routine treatment [9] for the past five years:—

(1) If no glands are palpable, surface irradiation is employed.

(2) (*a*) If the glands are palpable but operable, and if the condition of the patient is good and there has been a good local response, they are removed by a block section. (*b*) If removal of glands is not advisable, open or closed needling is employed.

(3) If the glands are inoperable they are given the primary treatment by deep therapy, followed either by needling or surface radiation by radium.

This crystallises to-day's position as regards choice of treatment of the cervical glands.

OROPHARYNX

In this situation the choice of treatment unquestionably falls upon radiation. The work of Harmer [16] (Semon lecture of 1931), of James Duffy [17] (Memorial Hospital, New York, 122 cases of carcinoma of the tonsil), and of Berven,[18] leaves no room for doubt that radiation is the method of treatment *par excellence* in this group of pharyngeal tumours. My own observations [14] have fully confirmed these views. Tonsillar tumours are highly malignant, very radiosensitive, and disappearance of the primary lesion occurs in about 90 per cent. of cases if adequately irradiated.

CASE 47.—Male, aged 55 years, epithelioma of left tonsillar area and both pillars of fauces, with extensive involvement of lateral pharyngeal wall. Treated at Westminster Hospital in 1928 by implantation of 16 radon seeds, 1·2 mc. each, screened by ½ mm. of platinum. Complete retrogression of the disease. Two months later block dissection of the left side of the neck. Histological section showed a deposit of squamous-celled carcinoma in one of the glands. Small local recurrence in region of posterior pillar, treated with diathermy a few months later. Well to date. Free from disease, five years.

CASE 463.—Male, aged 54 years. Heavy drinker. Extensive epithelioma of the ulcerative and nodular type occupying the right tonsillar fossa, lateral pharyngeal wall, and involving the tongue (Fig. 1). Hard fixed mass of glands in the neck. Treated at Mount Vernon Hospital. Interstitial irradiation of primary lesion by seven needles of 1 mg. R.E. each, screened by 0·8 mm. of platinum. Total in seven days 1076 mg. hours. Three weeks later one large cervical gland, the size of an egg, excised, and neck needled by the open method: seven needles of 2 mg. R.E. each for seven days. Total 3652 mg. hours. The gland was shown on histological examination to be filled with large alveoli of undifferentiated carcinoma cells, showing great variation in their morphology. A full course of deep X ray therapy was given six week after the open needling. The result is complete disappearance of both primary lesion and metastasis and no evidence of disease to date, two years three months.

HYPOPHARYNX

The hypopharynx presents a grave problem. In the words of Trotter [19]: "For the surgeon the pharynx combines three of the most formidable obstacles to the exercise of his art, it is inaccessible in a high degree, it is the seat of delicate and concentrated function, and it contains septic material to which the surrounding tissues are in no way immune."

It is therefore to the everlasting credit of Wilfred Trotter [19 20 21 22] that in face of these difficulties he evolved a method of surgical treatment, *the lateral transthyroid pharyngotomy*, which for the past 20 years has remained as the sole surgical measure of relief in these cases. Given suitably selected cases and a surgical technique of the highest order, the extirpation of the pharyngeal neoplasms is possible and has given brilliant results. But the operable cases are few and the successful issue of surgery is not in the hands of many. There remains therefore a large group of hypopharyngeal cancer where radiological methods offer the only hope either of palliation or of cure.

CASE 49.—Male, aged 64 years. Carcinoma of lateral pharyngeal wall with extension upwards to epiglottis. Histology: squamous-celled carcinoma. Treated at Westminster Hospital in 1928. Modified lateral pharyngotomy for access only. Insertion of 15 mg. of radium in eight needles; left in position seven days. Two months later surface irradiation of neck by means of a Colombia paste collar. Complete healing of lesion. Well to date, five years.

MAXILLARY ANTRUM

Tumours in this situation can be either sarcomata or carcinomata. Surgical treatment, as reviewed in literature, shows only a small percentage of five-year

survivals. There can be no question that surgical treatment by complete removal of upper jaw leaves a great deal to be desired. Radiation treatment, if adequate, gives gratifying results. If radiation is decided upon, the method depends upon the histological structure. A biopsy in such cases is therefore of primary importance. If the tumour be a sarcoma the choice of treatment should be high-voltage X rays without any surgical intervention. The results from X rays are unequalled by any other form of treatment—providing both the X ray machine and the man behind it are equal to the task. It leaves the patient with no external deformity and no functional disability. Symptoms disappear rapidly, hæmorrhage is arrested, and the eye, if proptosed rapidly, returns to the normal position. If the tumour of the antrum is a carcinoma preliminary X rays must be followed by radium treatment.

CASE 664.—Female, aged 17 years, admitted to Westminster Hospital in a state of advanced cachexia and a history of intermittent severe bleeding from the nose for the previous six months. The blood count showed two million red blood-cells and 28 per cent. hæmoglobin. There was a swelling of the left side of the face; a vascular tumour was protruding from the left nostril, the left eye was proptosed; left antrum opaque in a skiagram. Biopsy from the part of the tumour protruding from the nose showed a round-celled sarcoma. After two blood transfusions and iron and liver extract medication, a full course of high-voltage X rays was given by my colleague Dr. F. M. Allchin. There was a rapid response to treatment. Hæmorrhage stopped at once: the swelling of the face and the proptosis rapidly diminished. At present there is no evidence of disease clinically or radiologically. Well two years (Fig. 2).

CASE 794.—Female, aged 17 years. Advanced case of sarcoma of left upper jaw; proptosis, fixation of eye, swelling of glands on left side of neck. Biopsy of glands, sarcoma. Full course of X rays by Dr. Allchin, with rapid disappearance of all external deformity. This, however, was only temporary and local recurrence took place within six months; this again responded to treatment. But the patient succumbed from bony and visceral metastasis.

CASE 862.—Female, aged 15 years, under the care of Dr. Allchin. Histologically proved spindle-celled sarcoma

FIG. 3.—Dental plate with obturator after fenestration of palate.

of left upper jaw, with definite proptosis. Treated by high-voltage X rays as the sole method of treatment. Complete disappearance of tumour and deformity. Well to date, one year.

Although I have formed the opinion that sarcoma of the upper jaw is preferably treated with X radiation, we have tried the effect of radium on these cases and the response to treatment justified its use in selected cases.

CASE 194.—Male, aged 47 years, under the care of Mr. Gilbert Chubb at Westminster Hospital in 1929. Histologically proved sarcoma of left upper jaw, ethmoid, and frontal sinus, with large polypoid mass in left nostril, involvement of orbit and proptosis. When first seen the patient was drowsy and intracranial extension was suspected. The case was considered quite hopeless from the beginning. After a preliminary treatment with the 1 g. unit, interstitial irradiation was carried out, seven needles at 2 mg. R.E. each being inserted. There was rapid retrogression of the disease and a surprising improvement in the general health of the patient. The improvement, however, was only temporary, and intracranial extension of the disease killed the patient seven months later.

Surgical Approach to the Antrum

In antral carcinoma it is difficult to estimate the extent of the disease; it is therefore important to expose the growth surgically. It is possible to do so from the face, through the canine fossa, through the nose, or through the palate. It is the last-named method which appears to be the one of choice. It has been selected as the best method of approach by Douglas Harmer[16] in this country and Douglas Quick[23 24 25 26] in America, and has been used for over ten years, although it does not appear to be widely known.

FIG. 4.—Fenestration of palate for extensive neoplasm of antrum, condition four years after treatment. Both openings of Eustachian tubes seen; cavity obliterated by plate (see Fig. 3). Speech normal.

The object of the operation is to provide access to the growth (1) for irradiation by radium, (2) for purpose of drainage, (3) to provide a permanent inspection window so that possible remnants of growth or recurrences can be easily seen at their very inception. The operation is carried out with the diathermy needle under general anæsthesia. It is not necessary to interfere with the soft palate, and this and the uvula are preserved even in advanced cases when the posterior or pharyngeal aspect of the antrum is involved. Access having been obtained to the lesion, as much of the growth as possible is removed by means of a diathermy loop, extensions into the ethmoidal and sphenoidal areas being particularly looked for. Irradiation is carried out in two stages. The first stage consists in the immediate insertion of a large quantity of radium kept in position continuously for 24 hours. The quantity of radium used depends upon the volume of the cavity.[26] For the first stage of radiation, as the period of treatment is brief (24 hours), a high intensity is required. The average we use is 30–40 mg. of radium in tubes of 10 mg., filtered by 1 mm. of platinum. Ten days after operation the second stage of irradiation is proceeded with, a plaster cast of the cavity is taken and a hollow model is made consisting of two separate layers of shellac.

Radium in small needles is placed in between the two models which are then sealed. To facilitate the introduction and removal of the apparatus it is made in two sections. A dental plate incorporating 1 mm. of lead completes the apparatus; this is worn by the patient ten hours a day or more in

periods of two hours. The treatment is continued till the cavity is covered with a thin fibrinous layer. Residual small sequestra and crusts are removed from time to time till the cavity is entirely epithelialised. A permanent denture with a suitable obturator is then made.

CASE 143.—Female, aged 64 years. Extensive tumour of right upper jaw, with marked facial deformity, bulging of palate, and a soft swelling in the canine fossa; left nostril filled with growth. Biopsy through nose showed the tumour to be an endothelioma. Large fenestration of palate exposing solid growth within. Mass removed with diathermy. Interstitial irradiation in two stages: (1) four tubes at 10 mg. for 96 hours—total 3840 mg. hours; (2) shellac plate carrying 4·8 mg. of radium 24 hours daily for 13 days, 1497 mg. hours—total 5337 mg. hours. Later fitted with denture (Fig. 3). Functional result as regards speech is very good. No symptoms and no evidence of disease. Well to date, four years (Fig. 4).

Surgical Approach to the Pharynx

For successful radium therapy of pharyngeal growths by the interstitial method it is essential that access to the growth should be made in such a way as to interfere in the least possible way with the blood-supply and lymphatic drainage of the pharynx. Asepsis is of the utmost importance, and the occurrence of infection during or after radiation has in this situation disastrous consequences. Further, if complete arrest of the disease is to be hoped for, the whole tumour as well as the surrounding healthy tissue must be submitted to radiation of very high intensity. After scrupulous toilet of the mouth and extraction of teeth preliminary X ray treatment is given; this is followed by an endoscopic examination and a biopsy. The extent and accurate position of the growth having been ascertained as far as possible, the pharynx is exposed by a single oblique incision which is placed over the middle of the infra-hyoid muscles; careful hæmostasis is essential. The ala of the thyroid cartilage and the greater cornu of the hyoid, and a portion of cricoid, are removed with care, avoiding opening the pharynx or larynx. Radium needles of suitable length, screenage, and linear intensity are then placed in contact with the outer wall of the pharynx and retained in position by fine catgut sutures. The wound is closed without drainage. Tracheotomy is not essential although advisable in those cases where the growth encroaches grossly on the arytenoids. At the end of a week the wound is reopened, the needles removed, and the skin incision only partially closed.

CASE 982.—Male, aged 49 years, under the care of Sir Milsom Rees. Squamous-celled carcinoma of epiglottis. Twelve months' history. Small indefinite glands. Preoperative X ray therapy (one-third of a full dose) by Dr. Allchin, followed by dissection of neck for removal of a small gland, ala of thyroid cartilage, and cornu of hyoid. Insertion of 18 mg. of radium in long needles along the side of the pharynx for five days. No tracheotomy. Total dose 2160 mg. hours. I operated upon this patient by courtesy of Mr. Douglas Harmer who one month later on examination found the growth entirely disappeared. Well to date, one year six months.

Methods of Increasing Radiosensitivity

Surgery, X rays, and radium have more often than not been used as the sole method of treatment; if however one method fails, another is attempted, and it sometimes happens that radium failures subsequently become X ray successes and vice versa.

Instances of X ray failures which responded to radium therapy have also occurred in my own cases. It was noted at an early date that there were therefore definite advantages in combining X rays and radium; this combination is, of course, a recognised method of treatment of uterine cancer. The advantages of the combined method are twofold: (1) a greatly increased tissue dose can be given, greater than that by either method alone even to the extent of increasing the total dosage by 50 per cent.; (2) it appears that radiation of different wave-lengths increases the total radiosensitivity of a tumour. This can be applied in several ways. A preliminary X ray treatment enhances the effect of interstitial irradiation; X rays given at periodical intervals after a full radium treatment appear to increase the permanency of results. Finally, simultaneous X ray and radium therapy sometimes produce a dramatic resolution of tumours which did not respond to either of the methods separately. Sensitivity to radiation is at least to a certain degree dependent upon the structure of the cell, and by submitting the cells to the effect of different wavelengths it is possible to break down their resistance. The time relation of the two types of radiation is important and the shorter the interval the greater the sensitisation.

Methods of Radium Treatment

The methods of irradiation of the maxilla and the interstitial method of treatment in the pharyngeal growths have already been referred to. Needling of the tongue is so well known that the description of the technique would be out of place in this lecture; it has not varied greatly since the publication of a joint paper with Mr. Arthur Evans[27] five years ago. It may, however, be of value to enumerate certain cardinal principles, not all of which are fully appreciated or universally accepted. These principles are as follows:—

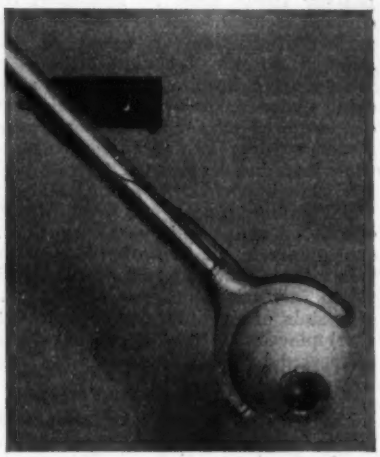


FIG. 5.—"Bomb" model No. 4. Westminster Hospital.

1. Uniform irradiation of uniform intensity throughout the period of treatment is desirable (hence my preference of radium to radon).

2. Maximum filtration[28] is the optimum filtration. Filtration is the key both to safety and efficiency. It enables the clinician to place the radium needles in close proximity to radiosensitive tissues (cartilage, bone) without risk of necrosis; it controls the factor time and hence the total dose. The very essence of interstitial radiation therapy hinges on filtration.

CASE 505.—Male, aged 66 years. Eight years previously, Whitehead's hemiglossectomy for carcinoma of the tongue. Well for seven years then developed recurrence, involving floor of mouth, lip, chin, and jaw forming a tumour the size of an orange. Interstitial irradiation at Mount Vernon Hospital. 78 mg. of radium in 36 needles, screened with 0·8 mm. of platinum, were inserted and left in position for 216 hours (nine days). Total dose 16,988 mg. hours; relatively an enormous dose. No necrosis of bone followed; the tumour disappeared entirely. Patient remained well for one and a half years, when he developed a cystic swelling

of the ascending ramus of the lower jaw for which further treatment was given with further relief for 12 months, when widespread recurrence took place.

3. Interstitial irradiation must cover a field considerably wider than the visible and palpable growth. The tumour bed and a fair margin of apparently

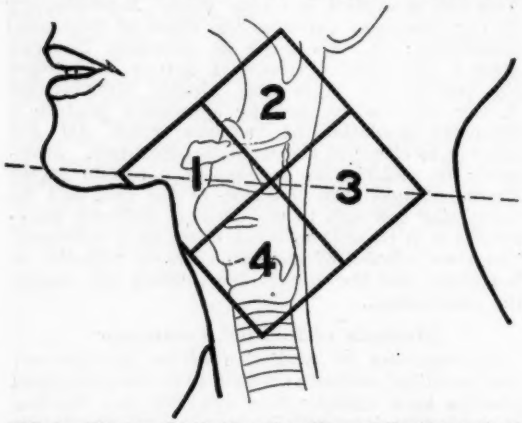


FIG. 6.—Diagram illustrating disposition of the four ports of entry for treatment of the tonsillar area and lateral pharyngeal wall.

healthy tissue must be irradiated if the incidence of local recurrences is to be diminished. As regards surface irradiation by means of collars we have adhered to the technique originally adopted at Westminster Hospital [27]—namely, a 15 mm. radium-skin distance, relatively small doses of radium e.g., 40 to 60 mg. for irradiation of a neck, treatment prolonged over two to three weeks. The modifications introduced consisted (1) in applying to clinical use the important observation on tissue culture which enabled Spear [31] to demonstrate the beneficial effects of the "split-dose," so that instead of a continuous irradiation of 14–18 hours daily short treatments now alternate with periods of rest; (2) in increasing the screenage by additional filters of metals of medium atomic weight (copper, brass, zinc) placed halfway between radium and skin as advocated by Sven Benner.[32]

Mass Radiation

The greatest advance in radium therapy of the mouth and pharynx lies, however, in the development of mass radiation. This method is in the process of development, but the immediate results obtained in the mouth and pharynx surpass anything that has so far been achieved in radium therapy. This method attempts to deliver a maximum intensity in the depth with the least inconvenience to the patient and the least damage to the skin. Large quantities of radium are required.

To understand the idea underlying mass radiation it is necessary to remember the rapid fall of intensity which occurs at short distances from the source. To deliver a therapeutic dose in the mouth or pharynx without burning the skin or mucosa, the container must be so constructed that at a reasonable distance from the skin, sufficient to prevent burns, there is still a depth-dose capable of influencing the lesion. The criteria necessary in the construction of such an apparatus for use in lesions of the mouth and pharynx are the following: The apparatus must be small, mobile, easily manipulated, fully protected, rigid when once fixed to the patient; the opening through which the rays emerge must be sufficiently small to enable numerous ports of entry to be used; a quantity of radium of at least 2 g., but preferably 4, 6, or more g. must be available. Extreme accuracy of treatment is essential; intimate coöperation between physicist and clinician is a sine qua non. Finally a unit of measurement must be used which makes it possible to compare tissue doses received from different distances. The container used at Westminster Hospital has been constructed with this aim in view (Fig. 5); it is incidentally the fourth machine built for the hospital. As knowledge increased modifications had to be introduced. The machine here described is already being superseded by a new one just constructed; this machine like the four previous ones has been built by Mr. Francis Carling, and I believe that the fifth model—incorporating the practical knowledge acquired in the use of the previous ones, designed with the help of all those intimately concerned in mass radiation—to be the most accurate, the most scientific, and the safest in existence in any clinic. In calculating the intensities at different distances in different planes it is convenient to make use of Sievert's unit. This is defined as follows:—

The unit for gamma-ray intensity is the intensity which is found at a distance of 1 cm. from a radium preparation consisting of 1 g. radium element (pure radium sulphate) in equilibrium with its disintegration products, this source of radiation being in all directions filtered through 0·5 mm. of platinum, and the dimensions of the preparation being so small that the source might be considered a point.

By taking into account the quantity of radium in the unit, the screenage, and the distance, the intensity output of any given apparatus can be

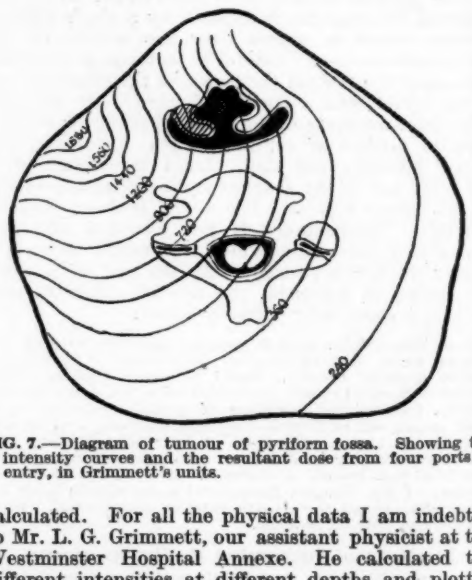


FIG. 7.—Diagram of tumour of pyriform fossa. Showing the intensity curves and the resultant dose from four ports of entry, in Grimmett's units.

calculated. For all the physical data I am indebted to Mr. L. G. Grimmett, our assistant physicist at the Westminster Hospital Annexe. He calculated the different intensities at different depths and plotted out the distribution curves.

For the treatment of a lesion in the region of the tonsil, lateral pharyngeal wall, and pyriform fossa, I have found it convenient to use three, four, six, or eight ports of entry according to the extent and position of the lesion, and the presence or absence of glandular involvement (Figs. 6 and 8). Grimmett calculated and plotted out the intensities through each separate port, and the total intensity of the combined ports is shown in Fig. 7. Dr. G. W. Phillips, the officer in charge of the bomb, made the

observation that with this unit at a skin distance of 3 cm. it required six applications of one hour to produce an erythema and dry peeling and seven hours to produce a selective radio-dermatitis. Grimmett suggests, as a unit of dosage in clinical work, the dose given by an exposure of one hour to unit intensity. As the 2 g. bomb at a distance of 3 cm. delivers an intensity of about 200 Sievert's units on the skin, so that in one hour 200 units of dose are administered, and since the skin erythema is reached in approximately six hours under these conditions, it follows that an erythema dose in these units is $6 \times 200 = 1200$ units. When multiple ports are used, the total dose is obtained by working out the dose through each port of entry and adding the results (Fig. 7). I propose for simplicity's sake in this lecture to call this unit the Grimmett Unit of Dosage. With the help of Dr. Phillips and Mr. Grimmett we were able to deliver doses sufficient to cause complete retrogression of the disease, although the effect on the skin was at times severe owing to the fact that only 2 g. of radium were being used and the radium-skin distance had to be short.

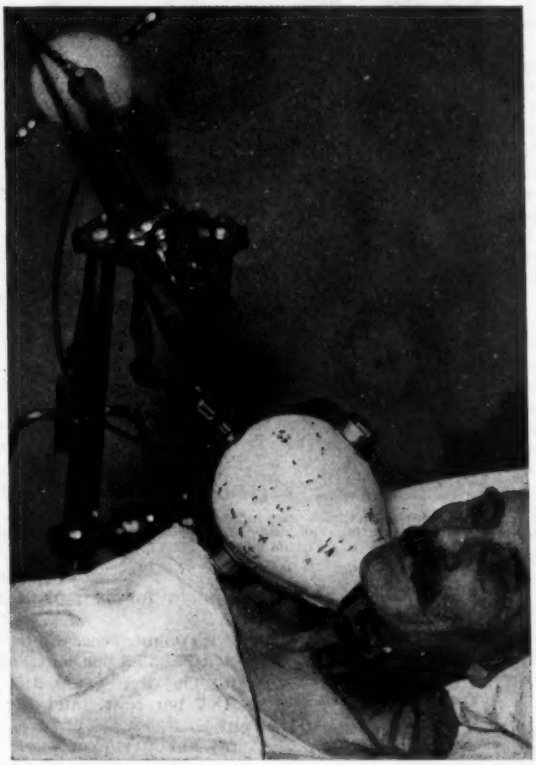


FIG. 8.—Carcinoma of pyriform fossa. Eight ports of entry mapped out. 2 g. "bomb" in position.

Our method has been to give one hour's treatment to one port per day; occasionally two ports were irradiated in one day. All the ports were treated in rotation. Each port never exceeded a total of six hours. The total treatment, including occasional periods of rest, can be carried out in 16 to 18 days.

To illustrate the possibilities of this method and show the immediate results, I would like to quote at some length the following cases:—

CASE 859.—Female, aged 62 years. Carcinoma of pyriform fossa on the left side, under the care of Mr. Douglas Harmer at St. Bartholomew's Hospital. Treated by deep therapy by Dr. Walter Levitt with complete disappearance of lesion for two and a half years. Then a recurrence occurred in the aryepiglottic fold and lateral wall of the pharynx. This was treated by me by resection of the hyoid bone and thyroid cartilage, and insertion of 18 mg. of radium left in position three days only. Total dose 1536 mg. hours. The lesion healed but there was rapid extension forwards on the epiglottis. This, therefore, was a case which had been previously irradiated both by X rays and by interstitial radium, and in which the growth was rapidly progressing. From all points of view an unfavourable case. Treatment by the 2 g. bomb was then instituted. Four ports of entry were used, all on the left side of the neck; radium-skin distance 3½ cm., two treatments a day except the last two days when one hour a day only was given. In all, 18 days including periods of rest. A total of 24 hours' treatment was given (3840 Grimmett units). Reaction of skin to a degree of selective radio-dermatitis (Fig. 9 on Plate). In the mucosa some swelling and dryness; moderate discomfort for about a week or ten days after treatment. Complete healing of the lesion, although acute dermatitis of the skin followed the treatment (Fig. 11 on Plate).

CASE 933.—Female, aged 63 years. Carcinoma of the left pyriform fossa, under the care of my colleague Mr. F. C. Ormerod seven months previously. Treated by deep therapy X rays by Dr. Peter Kerley, with considerable improvement and healing of the ulceration. When seen by me there was a scar in the pyriform fossa, and active disease of the aryepiglottic fold and epiglottis, massive œdema entirely hiding the left cord. This case resembled the previous one in being a recurrence after X radiation and not a favourable one. Treatment by the 2 g. unit; radium-skin distance 3 cm., eight ports of entry (four on each side) two hours daily, with occasional periods of rest. In all, 13 hours on left side and six hours on right side spread over three weeks (2670 Grimmett units). Reaction moderate, peeling of skin and filming of lesion. The œdema rapidly disappeared and the lesion healed entirely (Fig. 10 on Plate).

CASE 936.—Male, aged 50 years. Epitheliomatous ulcer of left pyriform fossa extending to and involving the laryngeal surface of the epiglottis, hiding the vocal cord; arytenoid œdematous. Extensive malignant cervical glands from mastoid process to clavicle. After a preliminary treatment with X rays by Dr. Allchin (140 per cent. U.S.D.), the following mass radiation was given: 2 g. unit, radium-skin distance 3 cm., eight ports of entry (four on each side), dose not exceeding three hours to each port; two hours daily (Fig. 8). Total 22 hours spread over three weeks, with occasional periods of rest (3160 Grimmett units). Skin reaction very slight, only a dry scaling. Some dysphagia for a week. Rapid diminution of glandular mass till only one small gland at the level of the angle of the jaw is palpable. Lesion healed.

CASE 879.—Male, aged 62 years. Twelve months' history of discomfort in throat. Extensive new growth of left tonsil, involving anterior and posterior pillars of the fauces and tongue. Some fullness in the left side of the neck at the angle of jaw. Papillary type of carcinoma, with ulceration of lingual part of lesion. Treatment by mass radiation: 2 g. unit, three ports of entry, at first one hour a day then two hours daily. Total 18 hours spread over 15 days (2520 Grimmett units). Reaction of fibrinous type with only very slight skin changes. Complete healing of lesion (Fig. 12, a, b, c on Plate).

CASE 872.—Female, aged 53 years. Increasing dysphagia since January, 1932. Examined at a laryngological hospital and was found to have a hypopharyngeal neoplasm, shown on biopsy to be a squamous-celled carcinoma. No treatment given as the condition was considered to be hopeless. In April, 1932, the growth had fungated through the skin, and a fistula formed on the right side of the neck. When first seen at Westminster Hospital four months later there was complete pharyngeal obstruction; any attempt at swallowing water was followed by escape of fluid through the fistula in the neck. Complete starvation with extreme wasting (weight 5 stone). Enlarged cervical glands, clinically malignant. Gastrostomy performed and the growth examined. It was found to surround completely

the hypopharynx. Treatment was given by mass radiation with extreme caution. Four ports of entry on right side of neck, 3 cm. radium-skin distance. Total 4338 Grimmett units. There was a well-marked reaction, with peeling of the skin. The lesion healed, the fistula closed, the swallowing improved till a normal meal can now be taken by the mouth. Weight increased by 2 stone (Fig. 13).

It is quite obvious to anyone conversant with radiation therapy that if this method by mass radiation is to be used effectively and with the greatest possible comfort, the radium-skin distance must be increased: this cannot be done without diminishing the tissue dose in the tumour unless a larger quantity of radium is employed. It is therefore reasonable to maintain that with larger quantities of radium properly applied in suitable containers, not only is the effect of irradiation increased but this improvement in results is accomplished with increased safety and comfort to the patient.

Berven [18] has used the method long enough to be able to compare the three-year results by the old method with the three-year results by the new method (3 g. mass). His comparison of results set out below (Table A) of the old method and the new method is sufficient testimony to the benefit which mass radiation has brought.

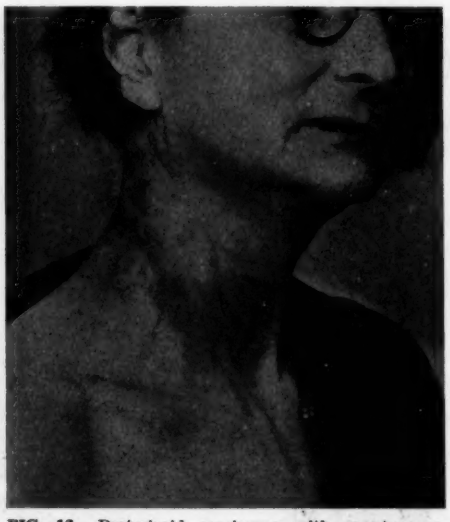


FIG. 13.—Postcricoid carcinoma with spontaneous fistula formation, right side of neck. Mass radiation with 2 g. bomb. Fistula healed. Increase in weight by two stone.

TABLE A.—*Carcinoma of Tonsil. Three-year results: Berven*

—	Primary healing.	Free from signs and symptoms for—		
		1 year or more.	2 years or more.	3 years or more.
	Per cent.			
OLD METHOD				
Carcinoma—Stage 1	50·0	16·7	0·0	0·0
„ 2	28·5	14·3	0·0	0·0
„ 3	13·3	6·7	0·0	0·0
Total ..	25·0	10·7	0·0	0·0
NEW METHOD				
Carcinoma—Stage 1	66·0	66·0	66·0	50·0
„ 2	100·0	100·0	50·0	50·0
„ 3	0·0	0·0	0·0	0·0
Total carcinoma ..	42·8	42·8	35·7	28·6
Lympho-epithelioma ..	100·0	75·0	75·0	75·0
Total carcinoma and lympho-epithelioma.	55·6	50·0	44·4	38·9

Statistical Survey of Results

In surveying the results of radiation treatment of cancer of the mouth and pharynx, I will confine myself to the statistics of my own cases. I will not attempt to compare figures of radiation treatment with those of surgical treatment. Such a comparison would in any case be fallacious, as surgical statistics refer only to operable cases—not a large group. I have treated without exception every case which presented itself, irrespective of the size or extent of the primary lesion or metastasis. I have not refused treatment even to patients with visceral metastasis. Only those patients who were obviously moribund or likely to die within a few days were not treated. In these circumstances statistics are not comparable with those of excision. The total number of cases of oral or pharyngeal cancer which I have treated and followed up is 337, quite an inadequate number for subdivision into operable, inoperable, and borderline subgroups, as each group would be too small for useful deductions. But such statistics as I present have one advantage: they show the end-results of a method of treatment of the disease as a whole in all stages. Finally, these statistical tables refer to a period of seven years which includes the very first cases and in which various methods were tried out.

The analysis of the tables shows that:

(*a*) Of a total of 337 patients, 113 (33·5 per cent.) are alive for periods varying from seven to one year.

(*b*) Tongue cases alone account for 225 cases, of which 75 (33·3 per cent.) are alive.

(*c*) The five years and six years survival figure is 18·7 per cent. (and the seven years figure 11 per cent.).

(*d*) For pyriform fossa carcinoma there were no survival-rates till new methods were applied.

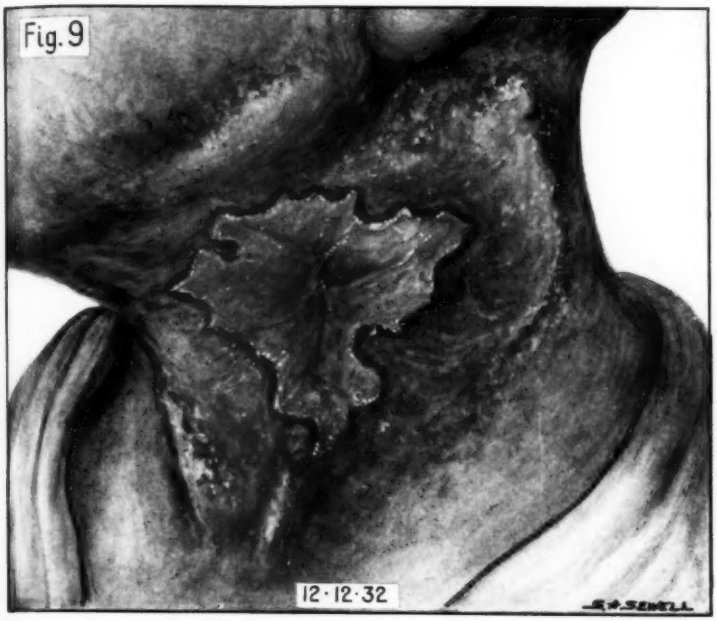
TABLE I.—*Carcinoma of the Tongue: Survival-rates 1925–1932*

Year.	Total cases.	Alive. No. and per cent.	Years of survival.	Year.	Total cases.	Alive. No. and per cent.	Years of survival.
1925	18	2 (11)	7	1930	46	12 (26·0)	2
1926	16	3 (18·7)	6	1931	34	15 (44·9)	−1
1927	16	3 (18·7)	5	1932	23	20 (86·9)	−1
1928	21	6 (28·5)	4				
1929	51	14 (28·2)	3	—	Total 225	75 (33·3)	—

What, therefore, is the case for radiation in cancer of the mouth and pharynx? I believe that I am justified in drawing the following conclusions:—

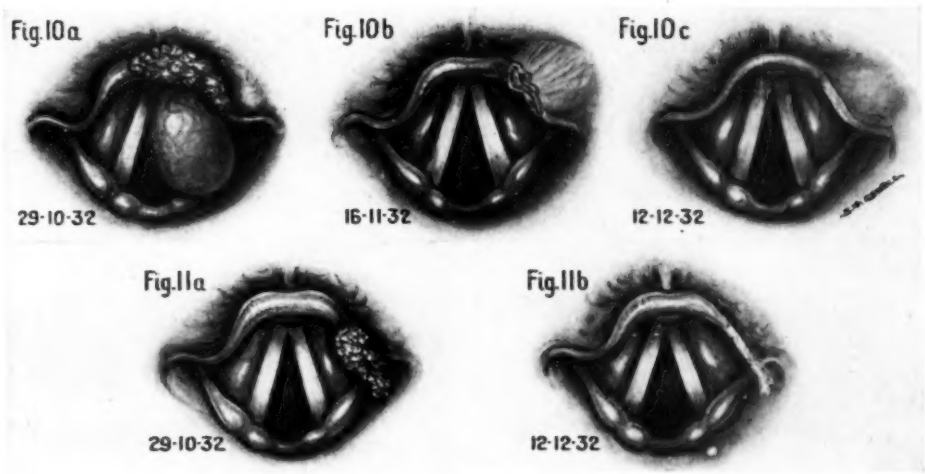
(1) Total disappearance of neoplasms including glandular metastasis can be achieved by means of radiation.

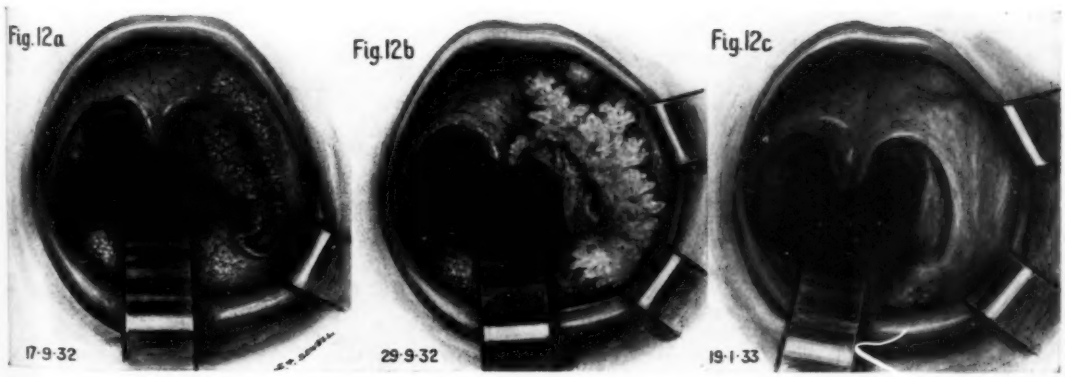
(2) The disappearance of the growth both primary and secondary may be permanent or temporary, but this is quite impossible to predict clinically.



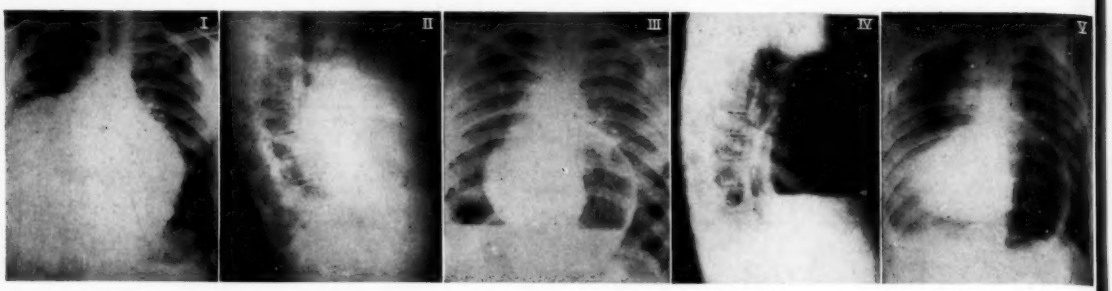
MR. STANFORD CADE: RADIATION TREATMENT OF CANCER OF THE MOUTH AND PHARYNX:

Fig 9: Selective radio-dermatitis following extensive mass radiation of carcinoma of pyriform fossa. Fig. 11 shows complete healing of lesion in the same case and Fig. 10 in a similar case. Fig. 12: Carcinoma of the tonsil before, during, and after treatment.

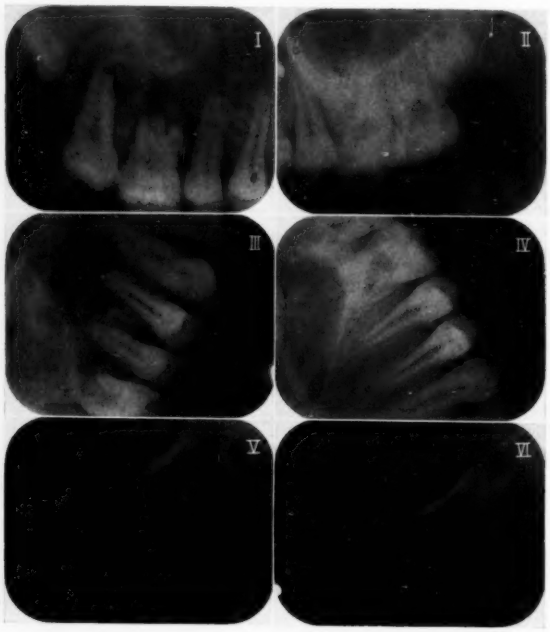




DRS. ADAMS AND HAWKINS: TUBERCULOUS PERICARDIAL EFFUSION



DR. BRODERICK: ANGIOMA OF MAXILLA



DR. LISTER: IDIOPATHIC STEATORRHŒA

DR. HALL: RELATION BETWEEN PULMONARY ARTERY AND ŒSOPHAGUS

(3) In the few years during which radiation has been used it has reached equality of status with surgical excision as regards operable cases.

TABLE II.—*Carcinoma of Posterior and Lateral Pharyngeal Wall: 14 cases*

Year.	Total.	Alive.	Method of treatment.	Effect on primary lesion.
1928	1	0	Peroral needling.	Not healed.
1929	5	0	Needling and collar.	Partial healing.
1930	3	0	1 g. bomb.	„
1931	3	1	X rays and open needling.	Healed.
1932	2	1	2 g. bomb.	„

TABLE III.—*Carcinoma of the Pyriform Fossa: 25 cases*

1927	2	0	Collar.	Not healed.
1928	1	0	„	„
1929	7	0	„	Partial healing.
1930	7	0	1 g. bomb.	Temporary healing.
1931	2	2	Open needling.	Healed.
1932	6	4	Open needling. 2 g. bomb.	„

(4) In inoperable cases it is the only available method of treatment.

(5) Radiation is a purely local remedy and has no influence whatsoever on the subsequent development of dissemination of the disease.

(6) In surgically hopeless cases palliation given by radium and X rays is certainly worth while from the patient's point of view.

TABLE IV.—*Total cases of Oral and Pharyngeal Cancer 1925–1932*

—	Total cases.	Survival. No. and per cent.
Tongue	225	75 (33·3)
Palate	32	16 (50·0)
Cheek	13	4 (30·7)
Pyriform fossa ..	25	6 (24·0)
Lat. pharynx ..	14	1 (7·1)
Tonsil	16	6 (37·5)
Antrum	12	5 (41·6)
Total	337	113 (33·5)

(7) The most powerful and most promising weapon we possess to-day is the "mass radiation unit."

(8) What we have yet to learn about radiation is infinitely greater than the little we know now.

Conclusion

In conclusion I would like to say that in spite of the pessimistic utterances of the ill-informed and ill-advised laymen, radium justifiably occupies an important place in the fight against cancer, and that there are to-day in Europe and America hundreds of men and women alive and in normal health owing to its beneficial effects. At Mount Vernon Hospital under the directorship of Sir Cuthbert Wallace the path to further progress is being cleared, and we can with confidence look forward to the future of radiation.

I wish to express my sincere thanks to my colleagues at Westminster Hospital, in particular to Dr. Allchin for his coöperation in the radiological treatment, and to Dr. Flint and Mr. Grimmett for their work in the department of physics. I would also like to express my very great appreciation to Dr. Phillips, the resident medical officer at the Westminster Hospital Annexe, and to Miss Parsons, the "bomb" officer, who were responsible for the accurate application of the "mass unit." I am also indebted to Mr. Douglas Harmer for much good advice, criticism, and help in many ways, and this it gives me great pleasure to acknowledge.

LEGENDS TO ILLUSTRATIONS ON SPECIAL PLATE

DRS. ADAMS AND HAWKINS

FIGS. I. AND II.—Before tapping: ant.-post. and lateral views.

FIGS. III., IV., AND V.—After tapping: ant.-post., lateral erect, and ant.-post. recumbent views.

DR. R. A. BRODERICK

FIG. I.—$+^{67}$ showing extreme absorption of $+^{6}$.

FIG. II.—$^{76}+$ for comparison.

FIG. III.—$+^{48}$ showing commencing absorption.

FIG. IV.—$^{54}+$ for comparison.

FIGS. V. AND VI.—Showing present condition of affected area.

DR. W. A. LISTER

FIG. II.—The pelvis of Case 1, showing greatly decreased density of the bones and distortion of the normal shape.

FIGS. III. and IV.—Radiograms of the forearms of Cases 1 and 2 respectively, showing greatly decreased density of the bones. On the left of each picture is the forearm of a normal woman of the same age, taken on the same film for purposes of comparison.

DR. A. S. HALL

FIG. I.—Radiogram of œsophagus and blood-vessels of a fœtus injected with barium emulsion, some of which has escaped into the pericardium. To show impressions made on the œsophagus by the aorta (above) and the right pulmonary artery (below).

FIG. II.—Oblique view of the same, showing the arch of the aorta, the ductus arteriosus, and the right pulmonary aorta.

FIG. III.—Mitral stenosis. The second impression shows here with the bronchus and pulmonary artery in line in front of it.

FIG. IV.—Advanced emphysema. The first and second impressions form one curve at the lower end of which are the bronchus and pulmonary artery.

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A CASE OF TUBERCULOUS PERICARDIAL EFFUSION

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(WITH ILLUSTRATIONS ON SPECIAL PLATE)

A. B., aged 20 years, in 1930 developed an aching pain in the right side of the abdomen, varying in duration and intensity, getting gradually worse and beginning to keep him awake at night. Later he began to vomit, the vomiting relieving him of pain for two or three days.

From January to March, 1931, he was seriously ill, with fever, 100°–103° F., during which his right arm and leg were swollen; there was also abdominal swelling, constipation, and severe abdominal pain eased only by morphia. He wasted almost to a skeleton, and then suddenly began to improve, making a rapid recovery. In August he again began to lose ground, developing a cough and dyspnœa, the sputum containing tubercle bacilli. During the winter he did not improve, and early in 1932 he entered a hospital where he spent a few weeks in bed. In August he was admitted as an ambulant afebrile case of pulmonary tuberculosis to the Delamere Sanatorium, and was sent to the North Wales Sanatorium for an opinion by Mr. Morriston Davies. He was then a well-nourished boy, and stated that he felt well. He had an occasional cough, scanty sputum, slight dyspnœa; his lips were faintly cyanosed, and there was clubbing and cyanosis of the fingers. There was no anæmia, no alteration of voice, no dysphagia, and the pupils were equal.

The chest wall showed no deformity, no bulging or abnormality of intercostal muscles, no signs of pressure such as dilated veins or œdema, and no enlarged glands. Measurements round the chest at the level of the nipples confirmed the symmetry, the right and left side each being 42 cm. on deep inspiration, with an expansion of about 3½ cm. The apex-beat could not be defined, and dullness extended from just outside the left midclavicular line to the right posterior axillary line, and from the second costal cartilages down to and continuous with the liver dullness. The heart sounds were very distant, and were conducted into the right axilla with maximum intensity at the pulmonary area. An occasional extrasystole was heard. There was no abnormal dullness at the back nor could the heart sounds be heard posteriorly. The radial pulses were equal and synchronous.

The percussion note at the right apex was poor, the breath sounds being harsh and accompanied by fine crepitations; there was a pleural rub at the right base posteriorly. At the left apex the note was poor, with fine crepitations along the vertebral border of the left scapula. The abdomen appeared normal.

The differential blood count was:—

Neutrophil polymorphs	75	per cent.
Large mononuclears	10	,,
Small mononuclears	14	,,
Eosinophils	0·5	,,
Basophils	0·5	,,

A complement-fixation test for hydatid was negative. Fluid for a Casoni test could not be obtained at the time.

Radiograms (taken at 4 ft. tube distance) antero-posteriorly (Fig. I. on Plate) showed a spherical shadow resting on and apparently attached to the diaphragm, and extending upwards and embracing the aorta. It extended from the right axilla across to the left midclavicular line measuring 21 cm. high by 23 cm. wide. The lateral view (Fig. II.) showed the spherical shadow extending from the sternum anteriorly to the middle of the bodies of the vertebræ posteriorly, measuring at its widest diameter 15 cm. The lung fields, where visible, showed a fine mottling throughout, most dense in the left upper zone. On screening no pulsation was seen.

DIFFERENTIAL DIAGNOSIS

In considering the diagnosis the very slight symptoms and the remarkable radiograms offered an interesting problem. The lateral radiogram showed the shadow to be above the diaphragm; its spherical shape suggested that it contained fluid, and a differential diagnosis of pericardial effusion, hydatid cyst, or dermoid cyst was considered.

A few cases of hydatid cyst have occurred in Caernarvonshire near the boy's home, and his constant contact with dogs and the latency of symptoms might favour this. Against this diagnosis was the low eosinophil count, the negative complement-fixation test, and especially the fact that there was a hemispherical shadow present on both sides of the chest, which did not give the appearance of displacing the mediastinum. A primary hydatid arises in a lung and never in the pleura, and a hydatid cyst of this size arising in a lung could never project across the midline to such an extent as suggested by the radiographic appearance, without a very definite displacement of the mediastinum.

A mediastinal dermoid cyst might present a similar radiographic appearance, but the cases previously reported have always been higher in position in the chest than this. Further, a dermoid would not have attained this size without giving pressure symptoms.

In coming to a diagnosis of pericardial effusion it was realised that had a tumour of this size been extrapericardial the heart must have been displaced, giving a corresponding displacement of the apex-beat and heart sounds, and the displacement would almost certainly have caused pressure symptoms and signs. Again, the lateral radiogram shows a shadow in exactly the position of the heart, and there is no other shadow which could be the heart. Finally, the absent apex-beat, the shape of the area of dullness, and the muffled distant heart sounds confirm this diagnosis.

EXPLORATION

In January, 1933, the boy at last consented to exploration, and he was admitted to the North Wales Sanatorium. On the day of admission before being put to bed he was found playing a game of football without distress.

He was kept in bed for a fortnight, and on the evening before operation was given nembutal grs. 1½ orally, a similar dose next morning. At midday, morphia gr. ¼ was given hypodermically, and half an hour later an injection of 1 per cent. novocain with 1 in 1000 adrenaline (0·5 c.cm. adrenaline to 60 c.cm. novocain solution) was made along the fourth and fifth costal cartilages on either side of the midline and into the adjacent spaces. In addition, the fourth, fifth, and sixth intercostal nerves were blocked in the right axillary line with 1·5 c.cm. novocain solution, and 5 minims of absolute alcohol to each.

One hour later Mr. Morriston Davies made an incision over the fourth right costal cartilage. The tissues were

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reflected and about 5 cm. of cartilage removed. An exploring needle was inserted into the pericardial sac and a muddy yellow fluid with lymph flakes was withdrawn into the syringe. Audible friction was produced when the needle touched the visceral pericardium. Two sutures were put through the parietal pericardium and a small incision made between them. Through this a catheter was inserted and two litres of fluid were syphoned off. The sac was washed out with saline. The sac was closed with purse-string sutures, and the skin incision with Michel's skin clips without drainage. During the operation the patient was quite conscious and showed no sign of shock. There was a slight rise in the pulse-rate towards the end.

A specimen of the fluid was examined at the central tuberculosis laboratory of the Welsh National Memorial Association by Dr. W. H. Tytler, who reported it as a very cloudy amber-coloured fluid. On centrifuging a fair amount of deposit was obtained, films from which showed amorphous material with several degenerated cells. By the Ziehl-Neelsen method about half a dozen acid-fast bacilli were found on direct examination. Broth culture yielded no growth.

Following the operation radiograms (Figs. III. and IV.) show the parietal pericardium to be in the same position as the periphery of the original shadow, the thickness of this layer being up to 0·5 cm. In the pericardial sac, which is now practically empty, the heart appears of normal size occupying a central position with its lower outline merged in the shadow formed by the remaining fluid, the level of which is just below the vertebral end of the tenth rib. The appearance of the heart suggests that it has rotated on its axis, its present right border giving the appearance of the normal left border of a heart; this is well shown in the radiogram (Fig. V.) taken with the patient lying down. A striking peculiarity of the pericardial shadow is that its greater diameter is across the right of the chest instead of across the left. It is interesting to speculate as to whether the torsion of the heart existed prior to the effusion and whether, therefore, this was responsible for the larger right-sided shadow. On screening, the heart could be seen in a rotated position beating in the fluid, while the sac showed slight expansion and contraction on expiration and inspiration.

Clinical examination showed a slightly higher pitched note over the original area of dullness, while the heart sounds were almost as distant as previously. On shaking a succussion splash could be heard without the aid of a stethoscope, and the patient himself was conscious of it. There was a slight serous discharge from the wound which dried in three weeks. After a fortnight the patient was allowed up and put on graded exercises. He is now (April) feeling very well and on top grade (fork and wheelbarrow). All symptoms have cleared up. There is no cyanosis, and the finger clubbing is less. Screening has shown the fluid to be slowly accumulating, until it is at the level of the vertebral end of the eighth rib.

COMMENT

The sequence of events would appear to be a slow onset of abdominal tubercle, later becoming very severe with a hæmatogenous spread to the pericardium and lungs. The chronic nature of the pericarditis is shown by the absence of symptoms of pressure, the large amount of fluid, and the thickness of the sac, while the lung involvement is confirmed by the positive sputum and the radiograms. According to Osler, "probably no serious disease is so frequently overlooked by the practitioner," and it is evident that tuberculous pericarditis is not a particularly rare condition. Wells [1] found it in 10 out of 1048 autopsies, Brooks and Lippincote [2] in 17 out of 61. Before the improvement in radiographic technique many large tumours were described, as, for instance, the dermoid cyst reported by Smith and Stone,[3] measuring 15×11×9 cm. Others compared with familiar objects appear to have been as large, but with more accurate measurements obtainable a definite comparison of sizes is now available.

Apart from the size, the interesting features are that the boy should have found himself capable of strenuous exercise before the operation, the ability to stand removal of such a large volume of fluid without shock, and the thickness and rigidity of the parietal pericardium, with the peculiar torsion of the heart itself.

We wish to acknowledge our gratitude to Mr. Morriston Davies for his encouragement, and to the Welsh National Memorial Association through Dr. Fenwick Jones for permission to publish the notes and radiograms.

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CAVERNOUS ANGIOMA OF THE MAXILLA

FATAL HÆMORRHAGE AFTER TEETH EXTRACTION

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With notes of a similar non-fatal case reported by
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(WITH ILLUSTRATIONS ON SPECIAL PLATE)

ON April 11th, 1932, a girl, aged 11, was referred to me at the Children's Hospital, Birmingham, suffering from "bleeding from the gums." On examination I found the left side of the face rather enlarged and slightly bluish with a pulsating spot over the malar bone; there were four scars, two over the malar bone, one near the inner canthus of the eye, and one over the region of the facial artery. Examination of the mouth revealed a perfect denture containing 28 non-carious well-articulating teeth. The left maxilla was slightly expanded and the two premolar and molar teeth were loose, but the gums were firm; on moving the molar teeth a little blood came from the sockets. The mother gave the following history:—

At 18 months a small nævus was observed at the angle of the nose and eye, and at 4 years the child was brought to hospital, where the late Mr. Nuthall saw her. During the next four years the facial and two or three branches of the internal maxillary artery were tied because of pulsation of the nævus and also because of bleeding into the nose. There had been no trouble with the temporary dentition, which had been shed naturally with the eruption of the permanent teeth.

A diagnosis of angioma or cirsoid aneurysm of the maxilla was made, and I gave the mother a note to consult with me and my partner, Mr. Harold Round, at our rooms on April 14th. This appointment was not kept, but on May 26th the patient again reported at hospital and was sent down to us. On examination the first thing that struck me was that the teeth were looser. The child had been bleeding and the mother produced a bottle containing about 8 oz. of blood shed in the night, a similar amount having been lost the previous night. This bleeding was apparently coming from the sockets of the molars. Radiograms were taken and models of the

mouth obtained. The radiograms show extreme absorption of the roots of the first molar tooth (Fig. I. on Plate) and less of the premolars and second molar. (Fig. III.) A comparison with the sound side was made. (Figs. II. and IV.) A vulcanite splint to obtain pressure on the wound in case of necessity was prepared. I arranged for the child to be admitted to hospital and for the resident surgical officer, Mr. W. E. Wimberger, to stand by during the extractions in case of undue hæmorrhage.

When I arrived at the hospital that evening I found that the child had been bleeding profusely, 8 oz. in as many minutes. This had been controlled by pressure on the teeth. In view of this I requested Mr. Wimberger to tie the external carotid artery. By this means I thought that I could extract the loose teeth and stitch up the wound tightly with no hæmorrhage, and hoped that the wound would be sufficiently consolidated before the collateral circulation was re-established. After the artery had been ligatured it was noticed that the pulsation on the cheek had ceased, and accordingly the wound was closed. I then extracted the first upper molar and there was immediately a gush of blood, which was with difficulty checked by my finger in the socket. A wool plug soaked in carbolised resin and tannic acid was then put in the socket and a temporary splint of Stents' composition held over it. While this was firmly held in position there was no hæmorrhage, but on the smallest movement it recommenced.

A consultation was held as to the next procedure, and the advice of Prof. Seymour Barling, who arrived

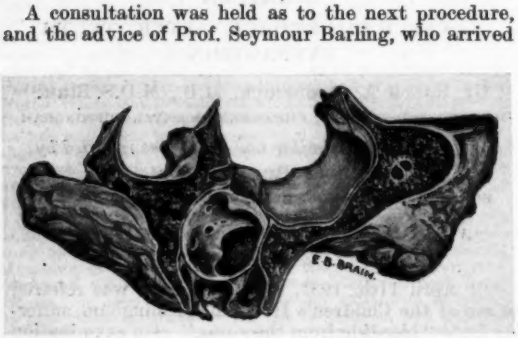

FIG. VII.—Drawing of a section of the maxilla showing the angioma.

in six or seven minutes in response to a telephone call, was obtained. It was decided to open the wound, dissect out the common carotid, clamp it and note the effect. This was done, and on removing the splint and plug only a slight trickle of blood came from the socket; therefore it was decided to ligature the artery. This operation was performed and at the same time a piece of the sternomastoid muscle was cut away to serve as a plug to be stitched into place in the sockets. It was then decided to extract the second molar, plug the sockets with muscle and tightly stitch the wound. The moment the second molar was extracted there was a gush of blood, just as violent as the first. This was with greater difficulty controlled with digital pressure and, although eventually plugs were fitted into each socket and stitched, the patient's heart and respiration ceased and in spite of everything that could be done the efforts to restore them were unsuccessful.

PATHOLOGICAL EXAMINATION

Examination revealed a large cavernous angioma in the maxilla spreading almost to the middle line with its floor formed by the roots of the teeth. (Fig. VII.) Its position accounts for the failure of the ligature of the common carotid to control the hæmorrhage, as it must have drawn a considerable blood-supply from the right side. Mr. A. W. Wellings, who kindly cut a section from the first molar, reports: "The section shows true absorption with well-marked typical excavations." Prof. Haswell Wilson, who performed the post-mortem examination, reports as follows:—

"The body is that of a well-built, slender girl. It is very anæmic in appearance. There is a recent left paramesial epigastric operation wound; a recent operation wound on the left side of the neck and old operation scars on the left side of the face. The latter are situated along the edge of the lower jaw, on the cheek along the inner side of the nose, and over the malar prominence. The thoracic and abdominal viscera contain very little blood, otherwise they are normal in appearance. The left external and common carotid arteries have been ligatured. On dissection of the structures over the left superior maxilla, that bone is found to be enlarged and the alveolar margin is expanded. The surface of the bone, especially over the malar process, is soft, spongy, and vascular. Two molar teeth have been extracted and the sockets are tightly packed with gauze. On opening the maxilla the whole substance of the bone between the alveolar border and the antrum is found to be occupied by a large cavernous angioma. This is irregular in shape and extends from behind the molar teeth almost to the middle line in front. It is covered by a mere shell of bone and is lined by endothelium in which the openings of innumerable vascular channels are seen. The lining is ruptured immediately above the sockets of the teeth which have been extracted."

Prof. Wilson concludes: "This child suffered from a large cavernous angioma in the substance of the left superior maxilla. This was probably of congenital origin but would tend to increase in size owing to absorption of the bone around it. By virtue of its position it would have an abundant blood-supply from both sides of the face, and ligation of the vessels on the left side of the neck would therefore not be sufficient to control hæmorrhage from it. The anæmic condition of the body is consistent with death from hæmorrhage. I am therefore of opinion: (1) that this child suffered from a cavernous hæmangioma of the left superior maxilla; (2) that she died as the result of hæmorrhage following the extraction of teeth; (3) that the immediate cause of death was cardiac failure whilst under the influence of a general anæsthetic."

MR. ROUND'S CASE

Dangerous hæmorrhage probably arising from a cirsoid aneurysm after extraction of a tooth; later hæmorrhage and operation, ligature of external and common carotid arteries.*

I have recently become acquainted with a very interesting case of hæmorrhage which occurred in the practice of the late Mr. J. W. Turner. Through the kindness of Mr. Heaton, Dr. McCardie, Dr. Brash, and Mr. W. Shilton, who have furnished me with notes, it is possible to give some details of the history of the case.

The patient, Miss T., then aged 12 years, saw Mr. Turner on July 20th, 1907, at 12.30 P.M., and complained of swelling and pain of a pulsating nature around the first right upper molar; and found that she could ease the pain by pressing hard on the cheek on that side. The gum in this area had been red and swollen since she was 6 years old, and the condition became very much worse as she cut her 12-year-old molars.

This swelling was thought to be an alveolar abscess; the tooth had been previously treated with arsenic fibre and siccaform dressing, and Mr. Turner decided to extract. Dr. McCardie gave N_2O. It was a simple and easy extraction but was immediately followed by a great gush of blood. Dr. McCardie says: "Blood spurted for a foot or two from the wound and a most severe arterial bleeding, drenching the clothes and filling the mouth, ensued. I thought that an abnormal palatine blood-vessel had been torn. The child quickly and quietly came round and was perfectly amenable, behaving splendidly. Attempts to plug the wound were useless, blood gushing forth as at first; and eventually, after a minute or two, I managed to compress the bleeding point, which seemed to be on the edge of the socket, with my finger, and stop the bleeding. The child became very pallid and white. While I compressed the

*Reprinted verbatim from the Midland Medical Journal, July, 1912.

socket Mr. Heaton was sent for, and he was able to plug the cavity and compress the bleeding point against the socket wall. Mr. Turner prepared a cork prop, which was held against the ribbon gauze plug by the lower teeth, and a four-tail bandage was applied. I have never before or since seen anything like such severe and dangerous hæmorrhage after tooth extraction."

The patient remained at Mr. Turner's rooms until 6.30 P.M., when she was quietly removed to her home. No recurrence of the hæmorrhage occurred and the plug was allowed to come out gradually; the wound healed well, but the patient was white and weak for some time after.

On Nov. 14th, 1908, Mr. Turner notes as follows *re* regulation work: "I had prepared bar with collars for molars, but on starting to adjust the collars found that the second molar tooth on right side was perfectly loose, just as though it was placed in a rubber sack which was resting in water. Under these circumstances I decided not to use it, and to leave regulation alone for a year or two." Then on Nov. 1st, 1909, this note occurs: "Complains of throbbing pain in upper right second molar—part swollen; when in bed and the hand pressed over the cheek the swelling appeared to go away—tooth very loose, seems to have no bony socket, extraction anticipated, surgeon and anæsthetist to be present if such be necessary." On Nov. 22nd there is a further note: "The patient has had a good deal of bleeding in night from distal side of upper right second molar; quite a cupful, and some bleeding the night before that. Advised consult her doctor."

On the following evening she had more hæmorrhage, when Dr. Brash was asked to see her, and describes the condition as follows: "On examination I found that on the right upper jaw she had a soft spongy pulsating mass to which two teeth were loosely attached and from which at this time there was some slight oozing. I advised consultation with Mr. Heaton in the morning. Later in the same evening, about 11 P.M., I received an urgent message to visit her, and found she was blanched and her pulse rapid and very feeble, and that there had been furious hæmorrhage from the pulsating mass. Her father had partly controlled the loss of blood by pressure upon the bleeding area. Mr. Heator was sent for at once and in the meantime the bleeding was controlled by introducing pads upon which pressure was made by the lower teeth. Mr. Heaton removed the pads and then the furious hæmorrhage was repeated. Pads were introduced again and a nurse sent for. Until the arrival of the nurse I compressed the carotid artery and then the nurse continued the pressure until early morning when the patient was removed to a nursing-home where Mr. Heaton operated."

In describing the operation Mr. Heaton says: "In the first place the second right upper molar was extracted and furious hæmorrhage took place. The external carotid artery was compressed, also the socket, and as the hæmorrhage persisted the external carotid artery was tied. It was then thought the hæmorrhage would cease and the upper right second bicuspid was extracted, when the bleeding was as furious as ever, decidedly arterial, not venous. The common carotid artery was then tied, and even after that the hæmorrhage persisted, and the bleeding could only be controlled with difficulty by pressure. A vulcanite cap was made to fit over the pads, and pressure kept up by this means for eight or ten days. The patient made a good recovery. There was nothing removed from the enlarged and spongy jaw except the teeth. After these were extracted there remained a cavity as big as a walnut which was not thought to be the antrum. All bone seemed to have disappeared."

At the present time the patient is quite healthy. Her gum tissue is slightly hypertrophied generally with some tendency to gingivitis, but there is nothing to indicate any recurrence of the previous trouble. At the site where the tumour occurred and the teeth were extracted the tissue appears to be quite normal, and very little more alveolar absorption than would be expected after the extraction of these three teeth. There is no history of hæmophilia.

The diagnosis appears to be that of a plexiform angioma (or cirsoid aneurysm), and it is interesting to note that the origin apparently occurred as the first permanent molars were cut and the climax was reached as the second molars were cut. Some injury to the tissues at this time might have caused the development of the tumour.

Mr. Round adds the following (1933): "This patient has been under my care since the above notes were reported. There appears to be no abnormality at the present time and her health is excellent. The upper right central incisor and first bicuspid were extracted during 1927–29 and no difficulties were met with. Radiograms of the affected area are reproduced. (Figs. V. and VI. on Plate.)"

IDIOPATHIC STEATORRHŒA OF ADULTS

A RECORD OF TWO CASES]

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(WITH ILLUSTRATIONS ON SPECIAL PLATE)

THE following cases are published with the object of supporting the observations of Bennett, Hunter, and Vaughan,[1] who have recently summarised the literature on this disease and reported 15 cases which they had been able to investigate very fully. It is not proposed, therefore, to make any further reference to the literature, or to enter, in any way, into a discussion on the pathology of the disease and its relationship to cœliac disease of children and tropical sprue.

The condition is regarded as a rare one, but possibly it is more common than is generally supposed, for it may present a great variety of clinical features, and steatorrhœa, which is the essential characteristic, may be by no means obvious. Often, therefore, the diagnosis may be missed, as it was, to begin with, in the first case here reported. It is certainly remarkable that three cases should have been encountered in a single practice in the course of two years. Two are here described and the third is fully reported in the paper already referred to[1] (Case No. 12).

THE FIRST CASE

The patient was a single woman, aged 21 years.

Clinical History.—The mother states that she was a full-time child, and was breast-fed for 12 months. Nothing unusual was noticed about the age at which she began to sit up or cut her teeth. She started to walk at the age of 18 months, and at this time a congenital dislocation of the left hip was noticed. This was treated with plasters for many months, but a permanent reduction could not be obtained. She talked by 2 years of age, and never suffered from rickets. From the age of 4 to 17 years she suffered every six months or so from attacks of vomiting, diarrhœa, and abdominal pain. At no time did she have any cramp, but she remembers having ulcers on the tongue while attending school. Menstruation began at the age of 17. In 1928 she was given a course of ultra-violet light, at the Plymouth Public Dispensary, on account of pain and weakness in the legs, and derived benefit from it. In August, 1930, an irritable eruption broke out on the nape of the neck and around the toes of the right foot. It gradually spread, and by December of that year the rash had involved large areas on all four limbs, trunk, and face.

Family History.—Her mother and father, brothers and sisters are all healthy, and no other case comparable to that of the patient is known of in the family. She has never lived out of England.

Clinical Notes.—In December, 1930, she was admitted to the City Hospital, Plymouth. At this time, the head, neck, and limbs, and to a lesser extent the trunk, presented numerous, large, irritable areas of dark erythema, up to 4 in. in diameter, sharply defined and more or less circular in outline. The surface of many was rough and weeping, and covered around the periphery with dark red-brown crusts. These secondary changes were more conspicuous in the lesions of the face, neck, and distal portions of the limbs, while on the trunk, thighs, and upper arms areas of simple erythema predominated. The cause of the condition was not recognised, and infective dermatitis was suspected. Mild parasitic and antiseptic ointments were used, but these had no effect whatever upon the eruption, and gradually the erythematous areas became confluent, and by the early spring the entire cutaneous surface was the site of a severe exfoliative dermatitis, which was intensely irritable and resented all but the mildest applications. An attempt at treatment with ultra-violet light caused very severe discomfort and had to be abandoned. Throughout the summer and up to the end of the year treatment consisted of simple applications such as calamine liniment. Although most of the hair had fallen out, some improvement in the skin condition was apparent by October, 1931, but she now began to complain of pain in various bones.

The first to be affected was the left clavicle. By December, 1931, she was so far improved as to be allowed home for Christmas, but she returned to hospital again in January, 1932, and remained for a further two months, by which time the skin had almost completely recovered, except for some generalised pigmentation. She now complained considerably of pain and tenderness in the trunk and limbs, and was unable to walk on account of it.

During the Easter holidays I was enabled, through the kindness of Dr. Donald Hunter, of the London Hospital, to examine some of his cases, and the resemblance of the present case to them was at once apparent.

She was admitted to the South Devon and East Cornwall Hospital on April 8th, 1932, for a full

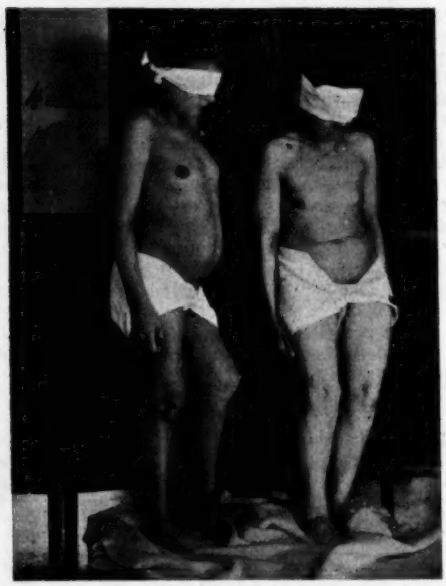

FIG. I.—Shows short stature in both patients, and in Case 1 (on the left) protuberant abdomen, and pigmentation of the skin, following the skin eruption.

investigation. By that time the softening of the bones had become very much worse and they were extremely tender on pressure.

On general examination she was very much undersized, height 4 ft. 7 in., weight 4 st. 10½ lb. (Fig. I., patient on the left.) The hair was very scanty and there was generalised pigmentation of the skin, with here and there still remaining some degree of scaling over the back and shoulders. She was of infantile appearance, and the breasts and pubic hair were poorly developed. The fingers and toes showed a very great degree of clubbing. The chest was barrel-shaped, with beading of the ribs and a well-marked Harrison's sulcus. There was severe genu valgum on the left side and the left hip-joint was dislocated. The abdomen was somewhat pendulous and protuberant. Chvostek's sign was strongly positive, but Trousseau's sign was absent. The tongue was clean and showed a glazed surface at the margin, and the teeth, though somewhat notched, were not by any means grossly defective. There was no complaint of diarrhœa, and the stools, though soft, were not in any way unusual in appearance. No abnormality was found in the heart, lungs, abdomen, or nervous systems, and the urine contained no albumin or sugar.

Examination with the *slit-lamp* showed no opacity in the lenses.

Wassermann reaction negative.

Fæces:

Total fat	.. ..	37·3 per cent. of dried fæces.
Fatty acids	.. ..	54·8 „ „ of total fat.
Neutral fat	.. ..	45·2 „ „ „ „
Plasma phosphorus	..	2·3 mg. per 100 c.cm.
Serum calcium	.. ..	11 „ „ „ „
Blood-urea	.. ..	25 „ „ „ „

Radiogram of bones revealed spontaneous fractures of the eighth and ninth ribs on the right side in the posterior axillary line, and there was conspicuous generalised rarefaction of every bone with failure of union of many of the epiphyses and great distortion of the pelvis. (Figs. II. and III., on Plate.)

Progress.—The patient was given four daily injections of 2 c.cm. of tetanol intramuscularly, and placed on a diet low in fat but high in calcium. She was also given grs. 60 of calcium lactate, nine pellets of radiostol, each containing 3000 international antirachitic units, and ½ oz. of Marmite daily. Under this treatment the tenderness in the bones cleared up in the course of a few weeks, and on her discharge on May 17th, 1932, she was able to walk as well as her crippled hip would allow her. She has remained on the above treatment ever since, and has continued in excellent health. Her hair is now thick and curly, and her skin supple and healthy. The clubbing of the fingers is very greatly reduced in degree. Chvostek's sign still persists.

Further special tests carried out in November, 1932, gave the following results:—

Plasma phosphatase	 27
Serum calcium	.. .. .. 9·8 mg. per 100 c.cm.
Urea concentration up to 2·85 per cent. urea.	
Glucose tolerance:	
Resting blood-sugar	.. .. 0·098 per cent.
½ hour after giving 50 g. glucose	0·110 „ „
1 „ „ „ „ „	0·136 „ „
1½ hours „ „ „ „	0·110 „ „

THE SECOND CASE

The patient was an unmarried woman of 39, referred to me by Dr. W. A. Trumper of Ivybridge.

Clinical History.—The patient was a full-time baby, breast-fed up to six months. Started walking at 16 months, and sat up, cut her teeth, and talked at the normal time so far as could be remembered. She stated that she had never suffered from rickets nor from diarrhœa, and was quite well until, at the age of 7, she began to get attacks of cramp in the hands and feet, which she illustrated by a most characteristic imitation of carpopedal spasm. These attacks would last for an hour or two and then pass off. As she grew older the attacks became more severe and prolonged, but they would always clear up during the summer months until the year 1931, for the whole of which some slight degree of cramp never entirely left her. The season was a particularly sunless one. At the age of 15 years she had an osteotomy performed on the right femur. The teeth of her second dentition were always poor and notched. Many of them became so loose that she had no difficulty in pulling them out with her fingers. Menstruation occurred between the ages of 14 and 15. Her tongue had never been sore, but she had suffered from "anæmia" in 1931. She had never been out of England.

Family History.—Her mother and father, a brother and four sisters are all alive and well. One brother was killed in the war.

She was admitted to the South Devon and East Cornwall Hospital on March 7th, 1932. *On examination* she was a very undersized woman, with poorly developed breasts and a slightly pigmented skin. Height was 4 ft. 6 in., weight 6 st. 11 lb. 13 oz. (Fig. I., patient on right.) There was a moderate scoliosis to the left, and considerable limitation of movement of both hip-joints. Her hands were permanently held in a moderate tetanic position, and she suffered frequently from attacks of painful and typical carpopedal spasm. Chvostek's sign was strongly positive, but Trousseau's sign was

negative. No other evidence of disease could be found in the heart, lungs, abdomen, or nervous systems, and there was no complaint of diarrhœa. The fingers and toes showed no clubbing. The few teeth that remained were very small and somewhat notched. The urine was in every way normal.

Fæces: Appeared normal.	
Total fat	43 per cent. of dried fæces.
Fatty acid	43 " " of total fat.
Neutral fat	57 " " " "
Serum calcium	7·9 mg. per 100 c.cm.
Plasma phosphorus	4 " " " "
Blood-urea	25 " " " "

Radiography of the bones showed generalised diminution of calcium salts in all bones (Fig. IV. on Plate) and a severe degree of osteo-arthritis of both hip-joints.

Treatment and progress.—Daily injections of 2 c.cm. of tetanol were given for two weeks. She was put on a low fat-high calcium diet, with calcium lactate grs. 60, six pellets of radiostol, each containing 3000 international antirachitic units, and 1 oz. of marmite daily. Under this treatment she very rapidly improved, and in a few days could move her hands freely, a thing she had been unable to do for many months. On March 22nd her serum calcium had risen to 9·6 mg. per 100 c.cm., and by April 13th to 11·3. The blood count on March 25th showed:

Red cells	4,950,000	Polymorphs	87%
Hæmoglobin	70%	Lymphocytes	9%
Colour-index	0·7%	Monocytes	4%

She has remained on the above diet ever since her discharge and has kept in good health without any recurrence of her cramp. In November, 1932, she was readmitted for further investigation and a review of her progress. Mr. C. B. F. Tivy kindly examined her eyes and reported as follows:

"Her vision is defective. She can count fingers at two feet with her right eye. With the left eye vision is 6/60, and with her glasses 6/36. She is wearing a +5 D sphere in each eye. In both eyes there are dense, flake-like opacities at the periphery of the lenses with radiating sectors. The changes are greater in the right than the left eye. The fundi could not be seen."

Further investigations showed:

Red cells	4,050,000	Polymorphs	68%
White cells	5,600	Lymphocytes	20%
Hb.	79%	Monocytes	9%
C.I.	0·8	Mast cells	3%

Plasma phosphatase	6·9
Serum calcium	9·6 mg. per 100 c.cm.
Urea-concentration test—over 3% urea.	
Glucose tolerance:	
Resting blood-sugar, 0·100 %.	
Blood-sugar ½ hour after giving 50 g. glucose	0·180%
" " 1 " " " " "	0·205%
" " 1½ hours " " " "	0·180%
" " 2 " " " " "	0·143%

CHEMICAL METHODS

Methods similar to those described in the paper by Bennett, Hunter, and Vaughan were used for all but one of the estimations described in this paper, and further references are not, therefore, necessary. The exception is the method used for estimating plasma phosphatase. A newer method described by Jenner and Kay [2] was used, which is very much simpler than Kay's older method.[3] A point to be noted, however, is that the average for normal cases by the new method is about 6·06 units as compared with 0·124 units by the other method—i.e., about 50 times as great. This difference must be borne in mind when comparing phosphatase figures in this paper with those of Bennett, Hunter, and Vaughan, who employed Kay's earlier method.

COMMENT

The main interest of these two cases is the diversity of complaints which brought them under observation. In the first the skin eruption appears to have been more severe than in any case hitherto described, and it completely dominated the clinical picture for more than a year. Throughout her stay in hospital nothing unusual was noted in the stools, and although she often had two motions a day there was at no time any suggestion of diarrhœa. The second case complained of tetany only, which symptom, by itself, naturally suggested a parathyroid defect. The stools appeared perfectly normal in every way, but as the first case was under observation at the time of her admission to hospital, an estimation of their fat content was carried out, and at once revealed the true nature of the trouble.

The main clinical features of the condition, as seen in adults, are: diarrhœa; softening of the bones, leading to general deformity or even spontaneous fractures; tetany, which may be latent and revealed only by eliciting Chvostek's or Trousseau's sign, or subjective, causing cramps or fully developed carpo-pedal spasm; anæmias of no constant type, but conforming either to the hypochromic or hyperchromic megalocytic varieties; skin eruptions, in which the lesions bear a superficial resemblance to psoriasis, but are liable to be more irritable, have not the same distribution and tend rather to be covered with crusts than with scales; and lastly, changes in the lens of the eye, which are usually slight and only to be discovered by examination with the slit-lamp. Complaint of any one of these conditions may bring the patient under observation, and it is essential, if the correct diagnosis is to be made, to bear the disease in mind and to make careful inquiry into the past history, particularly to determine whether in childhood the patient suffered from or was suspected of rickets or consumptive bowels. An attempt should be made to elicit Chvostek's or Trousseau's sign, and lastly, the stools should be subjected to analysis for fat, even if they appear perfectly normal, for it is the excess fat in the stools which is the essential characteristic of the disease. Treatment along the lines prescribed for the two patients here recorded gives very satisfactory results. Case 2 has survived the past winter without any return of cramp whatever, the first winter for 30 years during which she has been free of pain, and Case 1 is still continuing in excellent health. It is a pity that in this case the nature of the condition was not recognised earlier, for there is some evidence to suggest that the skin eruptions are due to a defect of vitamin B, and a good opportunity was lost of putting this theory to the test.

In conclusion, it is a pleasure to acknowledge the debt I owe to Dr. Donald Hunter for drawing my attention to these cases and for his encouragement and criticism. My thanks are also due to Dr. Eric Wordley who has carried out all the pathological investigations here recorded, and without whose assistance the case records would have been of little value; and to Mr. C. B. F. Tivy for examining the patients' eyes with the slit-lamp.

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OBSERVATIONS ON THE RELATION BETWEEN THE PULMONARY ARTERY AND THE ŒSOPHAGUS

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(WITH ILLUSTRATIONS ON SPECIAL PLATE)

In 1931 Parkinson and Bedford[1] described an impression on the œsophagus which they called "the pulmonary artery impression." In this note I propose to make some further observations on the subject.

At the level of the bifurcation of the trachea the œsophagus lies slightly to the left of the midline and so is behind the left bronchus; it then passes down behind the glands in the bifurcation of the trachea. In the adult these glands are very often bulky and are surrounded by abundant areolar tissue, the whole being in thickness about equal to that of the main bronchi. In one case dissected the glands were found in an abnormal situation along the medial border of the left bronchus, and the œsophagus showed a pouch projecting forwards to fill up the space normally occupied by these glands. At the lower border of these glands and areolar tissue the œsophagus passes behind the upper border of the left auricle. The distance between the upper border of the auricle and the bifurcation of the trachea is about 2 cm. In pathological cases the auricle may enlarge and occupy the whole bifurcation angle,[2] and may displace the bronchi (especially the left) upwards, so that the angle at which they leave the trachea approaches a right angle.

The right pulmonary artery runs across from left to right anterior to the left bronchus, the bifurcation glands, and the right bronchus; its course is horizontal, and the pericardium covers its lower half. At every point the artery is separated from the œsophagus by a distance about equal to the width of the main bronchi. The flow of blood in the part of the artery in front of the left bronchus is nearly directly backwards, and this will cause maximum pulsation at the point of contact with this bronchus.

Parkinson and Bedford described three impressions on the œsophagus: the aortic, "the pulmonary artery," and the left auricular. The second impression they supposed to be caused, in the main, by the right pulmonary artery in direct relation below the bifurcation glands. This relation I believe not to exist, for, as described above, the two structures are separated by the bronchus, glands, and areolar tissue. Further, the level of the second curve is higher up in the mediastinum than described by them—so much so that, as they remarked, the aortic and pulmonary impressions may run together forming one curve. The relations of these two arteries to the left bronchus are intimate; the aorta arching closely above it, sometimes forming an impression on the trachea just above the bifurcation, and then descending behind it, while the right pulmonary artery is in contact with it in front.

I believe, therefore, that the pulmonary artery impression is made by the left bronchus and to a small extent by the glands of the bifurcation of the trachea, these structures being pressed into the œsophagus by an enlarged pulmonary artery.

In radiograms taken at the appropriate angle, which is generally in the first oblique position, after a barium swallow, it will be found that the clear area representing the bronchus always lies between the dark circle of the pulmonary artery and the œsophagus. The size of this clear area may be decreased by altering the angle at which the film is taken, and thus the relation between the structures may be obscured.

Figs. I. and II. (on Plate) show the great vessels and the œsophagus of a fœtus injected with a barium emulsion, some of which has escaped into the pericardium; in Fig. I. the aortic impression on the œsophagus may be seen, whilst close below is the right pulmonary artery. Fig. II. is an oblique view, the fœtus having its right back against the screen. Here may be seen the arch of the aorta, the ductus arteriosus, and the right pulmonary artery. Fig. III. is from a case of mitral stenosis; the second impression shows here with the bronchus and pulmonary artery in line in front of it. Fig. IV. is from a case of advanced emphysema; here the first and second impressions form one curve at the lower end of which are the bronchus and pulmonary artery.

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EVIPAN: AN INTRAVENOUS ANÆSTHETIC *

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AND

A. Lawrence Abel, M.S. Lond., F.R.C.S. Eng.

SURGEON TO PRINCESS BEATRICE HOSPITAL AND TO THE GORDON HOSPITAL FOR RECTAL DISEASES; ASSISTANT SURGEON TO THE CANCER HOSPITAL AND TO WOOLWICH WAR MEMORIAL HOSPITAL

Evipan is a new intravenous general anæsthetic or basal narcotic which we have used during the last four months. It was introduced to us by Bayer Products, Ltd., but as at the time a sufficient supply was not forthcoming, one of us (A. L. A.) was fortunate in obtaining 100 ampoules whilst on the continent. It is with these ampoules that our 100 cases have been operated upon.

Chemistry.—Evipan-sodium is the sodium salt of N-methyl-C-C-cyclo-hexenyl-methyl barbituric acid, which dissolves freely in water, but only solutions in non-aqueous organic vehicles are stable. It is prepared either in the concentrated 33⅓ per cent. solution, which must be diluted with water shortly before use; or in a crystalline form, which must be dissolved in sterile distilled water, in either case to form a 10 per cent. solution.

The *pharmacology* of this drug has been carefully worked out and published in several German papers, and we find that all the stages of general anæsthesia take place in a few seconds, when the drug is injected intravenously into the human subject.

USES

(1) As a *basal narcotic*.. Complete unconsciousness may be obtained with the patient still in his bed

* The report of the Anæsthetics Committee of the Medical Research Council upon this drug will be found upon p. 43.

by using 3·0 to 5·0 c.cm. of evipan intravenously. The patient becomes unconscious in from 14 to 15 seconds, and thereafter any general anæsthetic may be used. We have not employed evipan as a basal narcotic, preferring our already standardised use of omnopon and scopolamine.

(2) As a general anæsthetic for *minor operations*. In the out-patient department we have used from 2·0 to 3·5 c.cm. of evipan, giving from three to five minutes' complete anæsthesia, and allowing ample time for dental extraction or extractions, opening of whitlows, abscesses, removal of sections for biopsy, setting of fractures, removal of nails, and similar minor operations.

(3) As a general anæsthetic for *short major operations*—e.g., appendicectomy, tonsillectomy, empyema, hæmorrhoids, and fistulæ—in fact, any operation not requiring more than from 20 to 30 minutes' general anæsthesia. We found in our first ten cases that evipan alone as a general anæsthetic was unsatisfactory after the first ten minutes or so. We then began to use our standardised basal narcotic of Roche's omnopon, gr. ⅔, scopolamine gr. 1/150, given one hour before the operation, and then found that the ordinary dose of 8·0 to 11·0 c.cm. of evipan in 10 per cent. solution produced a smooth and perfect anæsthesia, lasting from 20 to 35 minutes, and sometimes even longer.

(4) For *more prolonged major operations*. On three occasions where the operation was known to require more than half an hour, we have given a second intravenous injection of evipan 20 minutes after the first, with complete and satisfactory anæsthesia lasting for an hour to an hour and a quarter.

AFTER-EFFECTS

Where 2 or 3 c.cm. have been injected for a minor operation in the out-patient department, the patient is conscious in four or five minutes, and 15 minutes later has put on his clothes and walked home.

All cases operated upon in the in-patient theatre, with the preliminary standard premedication, have enjoyed a peaceful sleep for three to five hours, awakened, partaken of nourishment, and frequently slept again for several hours. Only on three occasions has there been any restlessness lasting for a few minutes to about an hour.

Immediately after the administration of evipan the jaw and tongue become relaxed, and care must be taken that a satisfactory airway is maintained. There is no doubt that, for a moment or two, there is definite diminution of activity of the respiratory centre, and we must stress that this should be watched, especially with older and more feeble patients. Except for this in two patients, there has been no cause for any anxiety, either on the operating table or after the patient has returned to bed.

At the commencement of our series the blood pressure of patients before, during, and after the injection of evipan was noted. It was found to drop rapidly about 20 per cent., both systolic and diastolic, but returned to normal in an equal space of time. The pulse-rate was found to rise to an equal degree, but again rapidly returned to normal.

Complete biochemical examinations were carried out on 30 cases before and after the use of evipan. In no case was any alteration in blood-urea, blood-sugar, urine, or fæces determined, up to 72 hours after the operation. These reactions were kindly carried out by pathologists at the various hospitals where we have been using this drug. In no case was anything found to show that evipan had any deleterious effect on any organ.

TECHNIQUE

Our technique has been: injection of one Roche's ampoule, omnopon gr. ⅔, scopolamine gr. 1/150, one hour before operation, for the average adult, with half that dose under the age of 16 or over the age of 70. The patient is in a drowsy state when placed on the operation table, and we have found it preferable to have everything ready for the operation before the injection is given. The injection is prepared, the solution being carefully mixed in a 10 c.cm. syringe, and given into the median basilic vein with the usual aseptic precautions. The first 2 or 3 c.cm. are given fairly quickly, with then a pause of 15 to 30 seconds, at the end of which time the patient is usually fast asleep. According to the estimated length of the contemplated operation, a further number of cubic centimetres are given. We have found that it is not necessary to take into consideration the weight of the patient, but we have used 2·0 to 3·0 c.cm. on infants and small children, and the maximum dose of 11·0 c.cm. for the average healthy adult for major operations. We would advise, however, that anyone using this drug should refer to Messrs. Bayers' table of weight until they have become accustomed to the use of this drug.

It has been noticed, occasionally, after the first few cubic centimetres have been injected that slight tremors may occur. These usually disappear in a few seconds, and the patient then remains quiescent, with normal pulse and respiration. It has been noticed where the dose has been insufficient that the patient has been resistant, although still quite unconscious.

RESULTS AND CONCLUSIONS

As already stated we have now used evipan in 100 cases (27 at the Cancer Hospital, 21 at the Gordon Hospital, 24 at the Princess Beatrice Hospital, 16 at the Woolwich Memorial Hospital, 3 in other hospitals, and 9 in private practice. Our clinical experience is as follows:—

1. *Minor operations on out-patients.*—Dose, 2 to 3 c.cm.; 8 cases (sections for biopsy, extraction of teeth, removal of toenails, &c.).

2. *Endoscopic examinations.*—Œsophagoscopies and bronchoscopies: dose, 7 to 11 c.cm.; 14 cases, including insertion of radium and removal of foreign body. Cystoscopies, ureteric catheterisations, and cystodiathermy in males: dose, 10 to 11 c.cm.; 5 cases.

3. *Rectal operations.*—Sigmoidoscopy, pectenotomy, and ligature of hæmorrhoids: dose, 10 to 11 c.cm.; 24 cases. Operations for fistula: dose, 10 to 11 c.cm.; 5 cases; one early case supplemented with gas-and-oxygen.

4. *Gynæcological.*—Dilatation and curettage with insertion of radium: dose, 7 to 10 c.cm.; 5 cases.

5. *Intra-oral operations.*—Tonsillectomy: 10 cases. Diathermy: 2 cases. Osteomyelitis maxilla; 1 case. Dental cyst: 1 case. Epulis: 1. Dose: 5 to 11 c.cm.

6. *Breast.*—Partial mammectomy: dose, 10 to 11 c.cm.; 4 cases.

7. *Laparotomies.*—Appendicectomy, 2 cases. Presacral sympathectomy, 1 case. Nephrectomy, 1 case. For undescended testis, 3 cases. Dose: 11 c.cm. Bilateral inguinal hernia, with fascial graft, 2 cases. Both these cases had a second administration 20 minutes after the first, one operation lasting one hour, one an hour and ten minutes. Empyema, 1; dose, 11 c.cm.

8. *Miscellaneous.*—10 cases.

On six occasions evipan was used again for the second or third stages of various operations, and on three occasions there was a double administration for the same operation. Of the first ten patients, who had no preliminary omnopon and scopolamine, three needed supplementary gas-and-oxygen before the end of the operation. At no time was any shock

noticed during or after the operation. On two occasions, where a little leakage occurred around the vein, no harmful effects were noticed.

In our considered opinion evipan is a useful addition to the surgical armamentarium, provided reasonable precautions be taken. The drug should never be used single-handed, since it is essential that the patient's airway should be continuously maintained. Moreover, in case of respiratory embarrassment we always have carbon dioxide and oxygen readily available, together with coramine and lobeline. Evipan is not, we believe, suitable for feeble or toxæmic patients, or those with cardiac or respiratory failure. As there is evidence of its detoxication by the liver, it should not be given to patients with jaundice. Until the drug has been more widely used, we feel that it should be administered only by an expert anæsthetist who will not only be able to maintain the airway and apply restoratives if necessary, but will also be ready to give a general anæsthetic should the operation take longer than is expected.

CONGENITAL CLUB-FOOT: AN ANALYSIS OF THE DEFORMITY AND THE PRINCIPLES OF ITS TREATMENT

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CONGENITAL deformities of the feet are common, 7 per cent. of congenital deformities being comprised by talipes equino-varus.[1] As there is one case of club-foot in each 1000 births, there are some 7000 cases of club-foot amongst the population of South Africa. This paper is only concerned with congenital talipes equino-varus. The object of adding to the voluminous literature of the subject is to formulate a definite and simple plan of treatment. The practitioner confronted with a case of this nature is bewildered by the variety of the advice offered by the various authorities, and it may be difficult to decide on a plan of campaign. Furthermore, and this is the burden of this thesis, club-foot should be

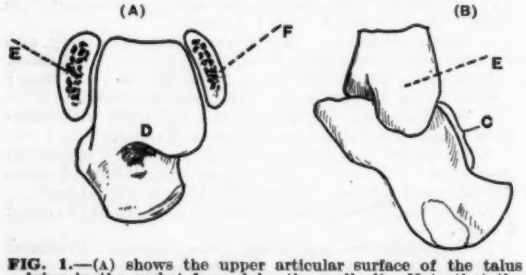


FIG. 1.—(A) shows the upper articular surface of the talus lying in the socket formed by the malleoli. Note that the surface is broader in front. (B) shows the ankle-joint from the inner side in a case of club-foot. The bracketed area, C, is the part of the upper articular surface of the talus which is displaced from its mortice owing to the plantar flexion of the talus. This is the area of bone which may offer great resistance to replacement. D = upper articular surface of talus; E = medial malleolus; F = lateral malleolus.

treated and treated correctly by the doctor in general practice. It must be understood that we are talking of club-foot in the new-born child. Once the patient is even a few months old I think the case falls within the province of those who have extensive experience.

[1] Jones, R., and Lovett, R. W.: Orthopædic Surgery, 2nd edition, 1929, p. 614.

The statistics of results of treatment of club-foot are very bad. It can be stated confidently that 95 per cent. of these cases will have perfect feet if correctly treated from birth, and such treatment is within the scope of the general practitioner. Why then does one see so many older children with feet which cannot possibly be cured even by the surgeon? One reason is that many parents are too sorry for their children to subject them to the discomfort of treatment, or they have been told the foot will come right as the child grows up. Another reason is that the average doctor has not been instructed in the principles of treatment, and the treatment necessarily fails. To obtain this understanding it is essential to be able to split the deformity into its component

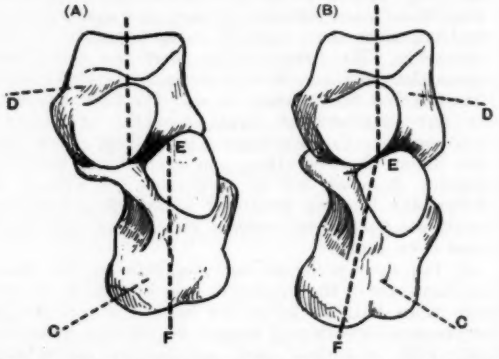


FIG. 2.—(A) shows the normal position of the calcaneus in relation to the talus. Observe that the axes of the two bones are parallel, though the calcaneus is lateral to the talus. (B) shows the relation of calcaneus to talus in talipes equino-varus. The calcaneus has moved medially as a whole so that the lower end of the axis of the talus meets the upper end of the axis of the calcaneus, but the calcaneus has rotated inwards as shown by the obliquity of the line EF. This is inversion of the calcaneus. The axes of the bones are represented by dotted lines. C = calcaneus; D = talus.

elements, so that each element may be separately and adequately dealt with.

AN ANALYSIS OF THE DEFORMITY

The foot may be divided into the hind foot and the fore foot. The hind foot comprises the talus (astragalus) and the calcaneus (os calcis). The talus is perched on top of the calcaneus or heel-bone, and is received into a three-sided box formed by the lower ends of tibia and fibula. This box is narrower behind than in front, the articular surface of the talus being of corresponding shape. As the talus is bent towards the ground (plantar flexed) in club-foot, it may "forfeit the right of domicile"—i.e., the wide anterior part of the bone may not be returnable to its mortice because of lack of room—this is *difficulty in reduction No. 1.* (Fig. 1.) The head and neck of the talus are bent inwards. The bony prominence felt on the dorsum of the foot just in front of the ankle is the body of the bone which we have just referred to as being displaced forward from its "box." Beneath the talus the calcaneus is situated. The two bones articulate at the sub-taloid joint, a joint of vast surgical importance particularly in talipes. The calcaneus is bent towards the ground like the talus, and is rotated *in* round its own long axis at this joint, and this inward rotation or inversion *must* be corrected in treatment. This is *difficulty No. 2.* (Fig. 2.) The heel is pulled up by the tendo Achillis. This is *difficulty No. 3.* In front of the two bones forming the hind foot is the fore foot articulating with the front end of the talus through the navicular (scaphoid)

and with the front end of the calcaneus through the cuboid. Thus are formed two separate joints, talo-calcaneo-navicular and calcaneo-cuboid. (Fig. 3.) These joints are spoken of collectively as the medio-tarsal or mid-tarsal joint. The inner component—talo-calcaneo-navicular—is much the more important joint, and as may be seen on the figure, it has been aptly compared to the hip-joint,[2] both being ball-and-socket joints. At the medio-tarsal joint there occurs in talipes equino-varus a movement of the fore foot inwards on the hind foot on a vertical axis passing through the medio-tarsal joint. (Fig. 4.) There is no *rotation* in this element of the deformity. It is as though you could move your fore foot inwards flat on the floor in such a position that the toes approached towards the heel. This is adduction. This is *difficulty No. 4.* The next element of the deformity is exactly the same as that which afflicts the calcaneus, the fore foot is rotated inwards around its long axis so that the sole looks inwards: this is inversion and is *difficulty No. 5.* Lastly, the fore foot is bent towards the ground at the medio-tarsal joint. (Fig. 5.) Observe, therefore, that the talus is flexed towards the ground, and so is the calcaneus and the fore foot. The calcaneus is rotated in, and so is the forefoot. It is generally said that the tibia is rotated in—i.e., twisted inwards in its lower portion. This factor may with advantage be forgotten.

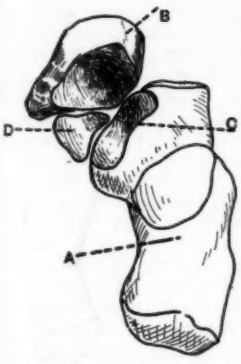


FIG. 3.—The ball-and-socket joint for the reception of the head of the talus. The socket is made up of the concavity of the navicular, the sustentaculum tali, and the spring ligament. A = calcaneus; B = navicular; C = sustentaculum tali; D = spring ligament.

There are three other types of congenital talipes equino-varus. These cannot be cured:—

1. Arthrogryphosis congenita multiplex—a maldevelopment of lower limbs and upper limbs, with very severe fixed club-feet, which no amount of treatment will cure.

2. Club-foot dependent on defects of the leg bones and parts of the foot.

3. Club-foot secondary to spina bifida and dependent on a neurological defect.

TREATMENT

Armed with these somewhat dull facts we are ready to deal with the new-born child that we are confronted with. The treatment should begin in the first week of life. The feet are examined; the spine is palpated for possible spina bifida, the shoulders and upper limbs are examined for defect such as club-hand, which would imply arthrogryphosis and a bad prognosis. Having satisfied ourselves that the case is one of simple equino-varus, look at the heel, if it is prominent the case is easy to deal with, as the heel can be gripped in manipulation; if the sole seems to run straight into the back of the leg, with little heel projection, the case is going to be more difficult. Tell the mother that treatment will take three years, but that the child will have a normal foot in appearance and function. The problem is this: (1) to over-correct the deformity; (2) to maintain the correction; (3) to ensure that the child can maintain the correction.

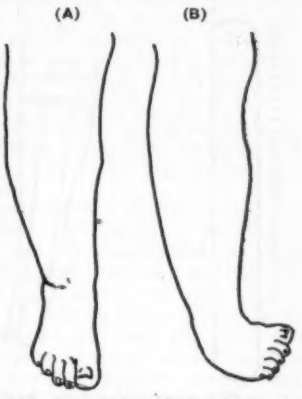


FIG. 5.—(A) shows the normal foot. (B) shows inversion of the foot.

To correct the deformity.—The essential fact to grasp is that to obtain correction of the deformity we must over-correct it. A good working rule is that the foot will relapse through 45 per cent. of the correction obtained. To obtain a correct position is therefore insufficient, we must over-correct.

Further remember that when manipulation is resorted to it is well to put the foot up in a position just short of the maximum obtained. Do not advise manipulation by the parents. We take many years to acquire this knowledge. It is unreasonable to expect the relatives to do so in a few minutes, besides stupidity, negligence, or fear of hurting the child are all disadvantages.

Correction by metal splint.—Obtain a piece of aluminium, 4 in. to 8 in. long and 1 in. broad, and flat, firm, but capable of being bent. Cover it with surgeon's lint, sewn on with a small amount of packing. This is to extend from the head of the fibula to ½ in. beyond the tip of the fifth toe. Fix the lower end first, hold the splint against the outer border of the foot, and put a piece of ¾ in. adhesive twice round foot and splint at the level of the metatarso-phalangeal joint. (Fig. 6.) Then

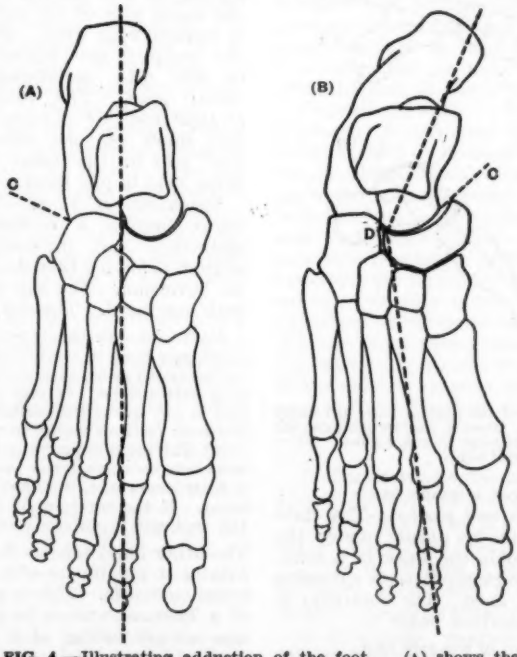


FIG. 4.—Illustrating adduction of the foot. (A) shows the long axis of the normal resting foot. (B) shows the adduction of the fore foot in talipes. Observe that the long axis of the foot is angulated at the medio-tarsal point, the fore foot moving inward round a vertical axis passing through this joint at D. C = medio-tarsal joint.

[2] Brockman, E. P.: Congenital Club-foot, Bristol, 1930, p. 35.

approximate the other end of splint to side of leg. If it bends the foot out too much, for a beginning bend the splint slightly at the ankle-joint so that it is concave inwards, and fix it to the leg with strapping

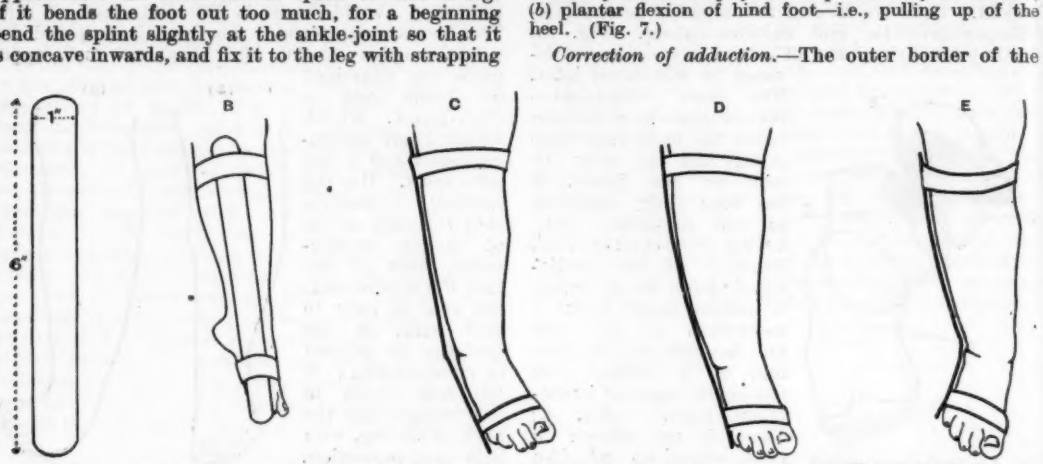


FIG. 6.—A = the splint; B = the splint applied; C = first application, splint concave inwards; D = later application, splint straight; E = splint convex inwards.

at its upper end. Bandage the splint on with an ordinary bandage. Repeat this procedure twice a week, bending the splint out a little each time till it is moderately concave *outwards*, by which time the foot will be straight instead of adducted at the medio-tarsal joint. In about three months we will have obtained the maximum benefit possible by this means. The equinus-flexion of foot towards the ground has not been affected at all by this treatment.

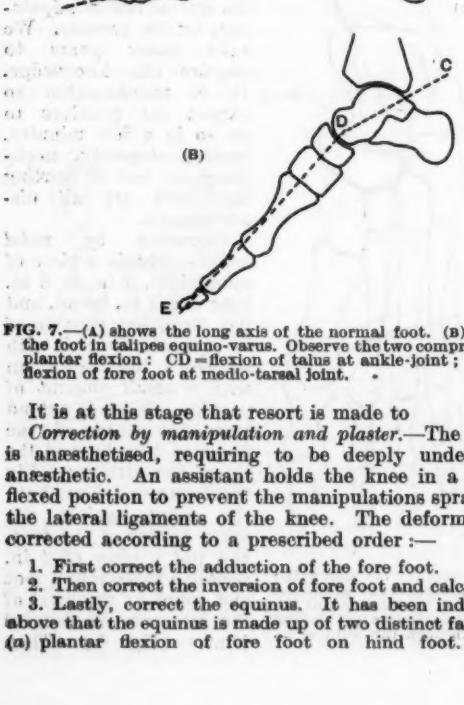


FIG. 7.—(A) shows the long axis of the normal foot. (B) shows the foot in talipes equino-varus. Observe the two comprise the plantar flexion: CD = flexion of talus at ankle-joint; DE = flexion of fore foot at medio-tarsal joint.

It is at this stage that resort is made to

Correction by manipulation and plaster.—The child is anæsthetised, requiring to be deeply under the anæsthetic. An assistant holds the knee in a semi-flexed position to prevent the manipulations spraining the lateral ligaments of the knee. The deformity is corrected according to a prescribed order:—

1. First correct the adduction of the fore foot.
2. Then correct the inversion of fore foot and calcaneus.
3. Lastly, correct the equinus. It has been indicated above that the equinus is made up of two distinct factors: (*a*) plantar flexion of fore foot on hind foot. This deformity has been aptly named plantaris by Brockman; (*b*) plantar flexion of hind foot—i.e., pulling up of the heel. (Fig. 7.)

Correction of adduction.—The outer border of the foot should be straight; in club-foot it is convex. This is the most troublesome element of the deformity to correct. It is difficult to obtain sufficient purchase to bend the fore foot outwards. At the age of 3–4 months it is much easier than in older children. One hand fixes the hind foot and lower leg bones, with the other the fore foot is grasped and forced outwards. Remember that even at this age correction of deformity requires the use of all the force an adult can use. If the adduction is readily over-corrected it is fortunate. Often the use of an orthopædic wedge is necessary. The foot is placed with its outer border resting on and at right angles to the sharp edge of the wedge, which is padded with wool. The edge of the wedge is just behind the base of the fifth metatarsal (medio-tarsal joint). The foot is now straightened by forcing the fore foot down on one side and the hind foot on the other side, each being held in one hand. (Fig. 8.)

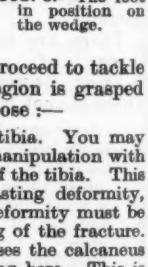


FIG. 8.—The foot in position on the wedge.

Correction of varus.—The term varus implies a combination of adduction and inversion. The adduction having been dealt with, we proceed to tackle the inversion. The heel and ankle region is grasped with one hand. This for a dual purpose:—

(*a*) To protect the lower end of the tibia. You may break any bone in the foot during your manipulation with no untoward issue, except the lower end of the tibia. This is a catastrophe. It may produce a lasting deformity, and in any event the correction of the deformity must be left over for four weeks to obtain healing of the fracture.

(*b*) The hand supporting the heel presses the calcaneus outwards to correct the inversion existing here. This is a most important, frequently neglected part of the treatment. If the rotation of the calcaneus is not rectified, the foot will assuredly relapse.

The other hand takes a firm grip of the fore foot and rotates it out on its own long axis so that the sole looks outwards. This is greatly simplified by the use of a Thomas' wrench in older cases. In the type of case we are talking of it is unnecessary. In fact no apparatus is needed, as one can improvise a wedge by using the sharp edge of a box.

Correction of equinus.—Remember constantly that equinus means more than a mere pulling up of the

heel, it means also plantar flexion of the fore foot on the hind foot. If you grasp the fore foot and force it up, you are correcting the plantaris only; you are not dealing with the plantar flexion of the calcaneus. Unless the fore end of the latter is pushed up, your patient will be liable to a very resistant type of flat-foot in later life (Forrester-Brown). The best means of dealing with the equinus is to lay the palm and hand flat along the patient's foot from heel to toes (the other hand supporting the ankle region) and to force the whole foot up. This deals with both factors constituting the equinus deformity.

The manipulation is now complete. You have had in mind the principle that every effort should be made to over-correct the deformity at the first seance (Jones). If the efforts have fallen short of this, they may need to be repeated several times. In the infant of a few months the correction can often be done at one sitting. The limb from mid-thigh to toes is now encased in plaster. (Fig. 9.)

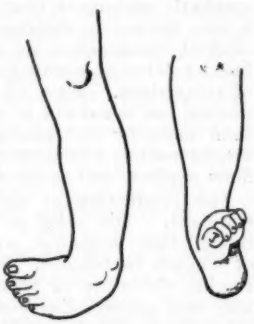


FIG. 9.—The overcorrected position (which is maintained by plaster-of-Paris) is seen in the right hand drawing. Compare this with the left hand figure which portrays the foot before treatment.

Application of plaster.—The limb is protected by wool, evenly applied and not too thick from mid-thigh to beyond the toes. The knee is flexed about 60°, otherwise the plaster will often slip owing to the podgy, conical shape of the limb in plump infants. The foot is held in the over-corrected position by an assistant. The importance of this person's duty is not realised. The assistant holding the foot must know enough about the elements comprising the deformity to be able to understand that he has to secure abduction, eversion, and dorsiflexion. It follows necessarily that, with the rarest exceptions, only a doctor well informed in regard to talipes can hold the foot in the over-corrected position. Unless this is done, obviously most of the correction obtained is going to be lost in applying the plaster. For this reason it is much better that the doctor hold the foot and the assistant apply the plaster under his direction. Use plaster 2 in. to 3 in. wide, and only 3 yards long. Do not pull the turns of the plaster tight, and apply it from without in, holding the foot in the correct position till the plaster is dry.

Dealing with the tendo Achillis.—It is only a few years since tenotomies of plantar fascia, &c., were a routine in the treatment of talipes. Tenotomy has no place in the modern treatment of the deformity with the solitary exception of the tendo Achillis. Never forget that this tendon is a valuable stay in your manipulations. It fixes the heel firmly and gives you a fixed point on which to work. Cut it and you destroy a valuable ally. It follows necessarily that you will guard the integrity of this structure until you have fully and completely over-corrected all but the equinus. You try to over-correct this at each manipulation. Often this succeeds. If it does not, then, and only then, do you deal with the tendo Achillis. In very young children it is sufficient to push a knife in under the skin and tenotomise the taut tendon. This may be done by the sliding method. We must remember that a tenotomised tendon retracts and is apt to lead to an unsightly "high calf" in after life, therefore it is always worth while doing an open lengthening so that you can control the extent of the retraction. Remember to sew the sheath separately. The tendon always re-establishes connexion between its divided ends whatever method of lengthening is used. After the division the foot may not go up sufficiently. This may be due to the posterior ligament of the ankle-joint holding it. This is an over-rated bar to reduction as the ligament is weak and it can be divided with no benefit whatsoever. The trouble is often due to the wide front end of the talus not having room to enter the ankle mortice. Forcible manipulation rectifies this, though it is never difficult in the type of case we are discussing.

Intervals between applications of plaster.—Once the plaster stage is reached, we reapply it each *four weeks*. At first the foot is manipulated on each occasion. Once efficient over-correction is obtained, the position must be maintained and only plaster can do this properly. It follows that a fresh plaster must be reapplied every month until the child can walk. I have had two cases of severe anterior bowing of the tibia owing to retentive plasters having been left on for too long. This is due to the fact that the position of the foot in the plaster puts a considerable torsion strain on the *growing* tibia, resulting in an unsightly bend disappointing to parent and doctor which requires the use of an osteoclast for its correction.

The only bad complications in the treatment of club-foot apart from failure to obtain over-correction are injury to the lower end of the tibia and bowing of the bone. Neither need occur.

Maintaining the correction.—Once the child begins to walk, the body-weight will tend to keep the foot in correct position. If the deformity has been thoroughly dealt with no apparatus whatsoever is necessary. Leg irons are a matter of history in the treatment of corrected club-foot. The outer side of the shoe may be elevated ¼ in. to increase the thrust on the outer side of the foot. A night splint made of plaster-of-Paris is worn when the child is in bed. It is merely the posterior half of a plaster cast applied with the foot in the over-corrected position.

Physiotherapeutics.—No massage can possibly approach in efficiency the active movements of a healthy child. Massage therefore has no place in the treatment of club-foot. The muscle on which the maintaining of the position of dorsiflexion in eversion is dependent is the extensor longus digitorum. It and that small offshoot called the peroneus tertius (a muscle peculiar to man) are the only muscles which can evert the foot in dorsiflexion. We are dependent entirely on this muscle to maintain the position. Therefore exercises to encourage its action represent the sole physiotherapeutic measure which is any use. No child of 18 months is going to pay much attention to learning an exercise, so that it is only between the ages of 2 and 3 that we are likely to achieve any result by exercises.

CONCLUSIONS

1. Simple congenital talipes equino-varus admits of almost 100 per cent. cure.

2. The treatment can and ought to be efficiently carried out by the family doctor.

3. To be efficient it must begin at birth, continue for three years, with a constant vigilance to detect relapse. The latter usually means incomplete correction.

4. Treatment consists of preliminary splintage followed by manipulation and plaster.

5. Tenotomies (except of the tendo Achillis), operations, and leg irons have no place in the modern treatment of cases of club-foot seen in infancy.

REVIEWS AND NOTICES OF BOOKS

Diseases of Infancy and Childhood

By LEONARD G. PARSONS, M.D., F.R.C.P., Professor of Diseases of Children in the University of Birmingham; Physician to the Children's Hospital and to the General Hospital, Birmingham; and SEYMOUR BARLING, C.M.G., F.R.C.S., Professor of Surgery in the University of Birmingham; Hon. Surgeon to the Children's Hospital, and to the General Hospital, Birmingham. London: Humphrey Milford, Oxford University Press. 1933. Two volumes. Pp. 1834. £4 4s.

IF we claim that the appearance of this great symposium on diseases of infancy and childhood is symptomatic of modern tendencies in medical thought and outlook, it is only fair to admit that in the development of pædiatrics as a specialised branch public opinion has led medical opinion. In the first of these two volumes is a short well-planned chapter, entitled the State and the Child, which shows that the intense interest in children, normal and abnormal, characteristic of the present age, first manifested itself in a number of scattered and often misguided sociological experiments. Medicine has been slow in taking the grave step of creating still another specialty, but of recent years the wisdom of differentiating the study of children's diseases has been proved, and there are now few general hospitals without departments staffed by specially equipped men established for dealing with the sick child. The literature of this important subject has hitherto taken the form of monographs or of text-books written by one physician or surgeon, perhaps with the collaboration of two or three of his colleagues. This work, with its imposing array of 46 contributors each dealing with that branch of the subject which he has made his own, is an innovation in pædiatric literature. It will not, of course, supplant smaller more individual works—such monuments of clinical acumen and literary style as Still's "Common Disorders of Childhood" will surely retain their popularity. But the specialty is developing rapidly over such a wide area that its records must keep pace, and the selection of experts here represented could hardly have been bettered.

This work follows in general structure the familiar lines of a modern text-book of medicine. The basis of the classification of diseases is largely regional, and disorders are grouped according to disorders of function—the nervous system, the respiratory system, the cardiovascular system, and so on being dealt with in their respective chapters. The result of the editorial collaboration between physician and surgeon is that the surgical aspect of the various lesions is given full consideration on the spot. Throughout the book stress is laid on prophylaxis. It is in the field of preventive medicine that much of the pædiatrician's most hopeful work must lie, and it is fitting that much space should be devoted to it here. Under this head may also be classed the chapters on growth and development, and on the management and feeding of normal infants with which the book opens; it is a weakness of the statistics of average growth that, as a rule, no information is given of the observations upon which they are based. The chapter on feeding of normal infants attempts to treat a controversial subject critically and comprehensively, and is more successful than much less succinct writing on this difficult theme. The section dealing with disorders of nutrition is distinguished by a masterly article on rickets. A disappointment here is the dismissal of the subject of dental caries with the words: "We are unable to express an opinion concerning . . . the relation of rickets to dental caries" (p. 272). In a book of this scope some discussion of May Mellanby's observations and of the arguments for and against the association between vitamin-D deficiency and dental caries might have been expected. For those who are not specialists of considerable experience the chapter on peculiarities of disease in the child will be found very useful, and we are glad to note an emphatic statement that pulmonary tuberculosis is a rare disease in childhood. On p. 704 begins the clearest classification we have yet seen of that confused medley of conditions grouped under the name of infantilism. Much of Section 17 is pure orthopædics, but is not out of place here, and gains rather than loses by the necessary compression. In the second volume a chapter on radiography in diagnosis finds a place, and is illustrated by some fine plates.

The production of these volumes is of a high standard. The print is excellent, and the paper, though thin, is opaque, which cannot always be said of English text-books. The book is unique in the English literature of pædiatrics, and should gain a wide and appreciative public.

The Pelvis in Obstetrics

By JULIUS JARCHO, M.D., F.A.C.S., Consulting Gynecologist, Hastings Hillside Hospital; Attending Obstetrician and Gynecologist, Sydenham Hospital. New York: Paul B. Hoeber. 1933. Pp. 365. $6.

THE importance of accurate pelvimetry in antenatal examination has of late been somewhat neglected. It is rare to find this aspect of obstetrics treated adequately in a text-book written in English as it is here. Dr. Jarcho devotes a long chapter to the normal female pelvis, and has collected numerous statistical data showing the variation of pelvic measurements in the different races of the world. The abnormal pelvis is not treated so fully; more information might have been supplied about the effect of different types of contraction on the course of pregnancy and labour. The incidence of contracted pelvis in various countries is noted, and treatment by the Walcher position, induction of premature labour, and Cæsarean section are discussed. In the chapters on external and internal pelvimetry statistics are used to show to what extent variation of a measurement from the normal can be taken as indicating internal pelvic contraction. There is some confusion, in the description and statistics, about the definition of the term "conjugata vera," which should be restricted to mean the measurement from the sacral promontory to the nearest point on the back of the symphysis pubis. The direct measurement of the fœtal head in utero is described, and methods of comparing the fœtal head and the pelvis are fully discussed. Two chapters are given to X ray examination, and the account of technique is careful and thorough. In this country X ray pelvimetry and cephalometry are very little used because special methods are necessary to eliminate the effect of distortion seen in the film. When the X ray photograph of the pelvis has been taken the patient is moved away and, without altering the position of the X ray tube and film,

a centimetre scale is placed at the level formerly occupied by the pelvic brim, and a second exposure is made on the same film. The actual measurements at this level can then be read off directly by the use of the scale. The fœtal head can similarly be measured by exposing the scale at the level which it occupied. X ray measurement is particularly important in certain cases, such as transverse contraction at the brim, where the ordinary external and internal measurements may be within the limits of normality.

This book is well illustrated and has an extensive bibliography.

Recent Advances in Radium

By W. ROY WARD, M.B., B.S., M.R.C.S., Medical Director and Surgeon to the Radium Institute, London; and A. J. DURDEN SMITH, M.B., B.S., M.R.C.S., Surgeon to the Radium Institute. London: J. and A. Churchill. 1933. Pp. 324. 21*s*.

THE authors of this book have set themselves a very difficult task; the field which they have to cover is enormous, and it is inevitable that there should be omissions and that dogmatic statements should be made on subjects still open to question. This book is divided into three sections. Part I. deals with the scientific aspect of the problem, Part II. with the treatment of malignant disease, and Part III. with the use of radium in certain benign conditions. It is in Part I. that some weakness, due to the effort to condense into less than one hundred pages the consideration of all the general properties of radium, is most apparent. Although medical interest is naturally centred on the clinical side of the question, the importance of the principles on which therapy is founded cannot safely be under-estimated. The sections on general considerations and physics follow conventional lines; they are pleasantly written and easy to follow. Those on the action of radium and radiosensitivity are of great interest. The question of the importance of direct action on the tumour cell, as compared with the indirect action on the blood-vessels and fibrous tissue formation is discussed at some length and certain experimental work on which conclusions have been based is mentioned, but the essential relationship between the effects observed and tissue dosage is not made obvious. The summary of the methods devised to estimate dosage is clear and avoids controversy. The figures illustrating Stahel and Murdoch's method are not perhaps well chosen. Fig. 8 represents the isodose curves when the radium is placed directly on the part to be treated (h=0 cm.); Fig. 9 represents readings with the radium at a distance of 1 cm. (h=1 cm.); so that any attempt to use these figures for calculating dosage would result in a serious error. No mention is made of Sievert's condenser chambers, nor is the importance of the time factor in dosage discussed.

Part II. is devoted to a consideration of the various types of malignant disease in the treatment of which radium has a definite place. The experience gained at the Radium Institute, London, and the description of the methods in use there add greatly to the value of the section; and the recognition that surgery must play an important part in treatment provides a well-balanced discussion. The methods in use at the leading European and American clinics are described; those of the Fondation Curie, Paris, the Radiumhemmet, Stockholm, and the Memorial Hospital, New York, are regarded as the most important. Radium clinics, each having elaborated its own technique, are so numerous that selection of material must have been a matter of great difficulty. It has been well done. Space might, however, have been found in the chapter on cancer of the uterus for a note on the combination of heavy irradiation with radium and X rays, and the Schauta hysterectomy in Stoekel's, Adler's, and other clinics, and in the the chapter on cancer of the bladder for the results claimed by Gunsett of Strasbourg. So much work has been done by the authors in assembling the data that it seems a pity they have not presented the figures in the form of tables, in order to enable the reader easily to compare results obtained by different methods. The section devoted to such conditions as pitch warts (a very large number of which have been treated at the Radium Institute), nævi, and angiomata is of especial value, and the detailed instructions are welcome.

Some omissions and unwarranted dogmatic statements are inevitable in a summary which endeavours to cover so much ground, but as a collection of scattered information for the benefit of those practising radium therapy in the English-speaking countries the work will be widely appreciated.

St. George's, 1733–1933

By J. BLOMFIELD, O.B.E., M.D. Published for St. George's Hospital by the Medici Society, 7, Grafton-street, London, W. 1933. Pp. 120. 5*s*.

THE bicentenary commemorative history of St. George's Hospital, which was quoted in our leading columns last week, has appeared, and fills well the purposes for which it has been written—namely, to record the story of the institution up to date, and to interest the public further in its future destinies. Dr. Blomfield divides his subject into four sections, each covering 50 years. The tale of the first section is of the foundation and early expansion of the institution; the second 50 years are marked by consolidation of effort and the rise in scientific fame associated especially with the work of John Hunter. During the third 50 years, a period of reconstruction, occur the discovery of anæsthesia, the rise of antiseptic surgery, the introduction of skilled and trained nursing, and the vast development in medical education associated with scientific progress in every field. During this period the school of anatomy and medicine adjoining the hospital, "Lane's school," where many of the students received their training, was closed, while, also, the premises of the medical school proper, situated in Kinnerton-street, were given up. Henceforth the education of the students, apart from their clinical training, was conducted in buildings attached to the hospital. The last section, bringing the book up to date, records more particularly the advances in specialisation which have been the distinguishing mark of recent years in all institutional treatment of the sick.

In each section of the book Dr. Blomfield provides a running commentary upon the life of the hospital, illustrated by the characters and performances of the more prominent members of the staff. These little biographies, in spite of their necessary compression, tell the necessary things about the dead leaders—they are gracefully written, generally kind, and often amusing. In each section also the material developments of the hospital are described, and so from two aspects and over a period of 200 years we get a vivid picture of hospital life in London. A feature of the book is the charming illustrations, mostly reproduced from prints lent by Dr. H. R. D. Spitta. Such pictures as that of "The Turnpike at Hyde

Park Corner 1786," "Hyde Park Corner 1800," "The Entrance to Hyde Park Corner 1813," and "Views of Hyde Park Corner 1828 and 1836" will puzzle many who know the present aspect of one of the most frequented centres of London. Of course to remember the original site of the Wellington arch is not a proof of senility, yet the recollection of Hyde Park Corner 50 years or so ago is dim with most people.

The publicity which has been given to the fact that the hospital is actually contemplating early rebuilding should not have an unfortunate effect by deterring students from entrance, for the public service of a hospital can be maintained throughout the stage of transformation, infinite though the trouble may be. Dr. Blomfield's book shows that this situation was met successfully at St. George's Hospital in its early days, and it can be met again.

The Tides of Life

By R. G. HOSKINS, Ph.D., M.D., Director of Research, Memorial Foundation for Neuro-Endocrine Research, Research Associate in Physiology, Harvard Medical School. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1933. Pp. 352. 15*s*.

IT is not quite clear for what class of reader this book is intended. From its rather popular title and the explanations of technical terms that Dr. Hoskins so frequently supplies, it would seem to be meant primarily for the instruction of an inquiring lay public. Whatever the intention, the result is a readable book, delightfully free from dogma, which sets out, in simple language and with moderation, the present state of our knowledge of the endocrine glands, and the devious paths by which that knowledge has been reached. Each gland is dealt with in a separate chapter, which traces historically the gradual evolution of the opinions held at the present time and the researches and discoveries that have led up to them. No attempt has been made to give an exhaustive account of all the investigations which have been made, but, as Dr. Hoskins says in his preface, he has "assumed the privilege of strolling through the literary gardens of his contemporaries, gathering at will." In this way he shows clearly just how far, by groping laborious stages, our real knowledge has been carried; he shows also—and this is no less valuable—the large gaps in it, and points out the lines along which further thought and research should be directed. Within the limits that the author has set himself, the monograph is extraordinarily complete. It should prove of value to the practitioner who wishes to bring his general knowledge of endocrinology up to date.

An Introduction to the Computation of Statistics

By SHEPHERD DAWSON, M.A., D.Sc. London: University of London Press. 1933. Pp. 192. 10*s*. 6*d*.

IN spite of the increased use of statistical methods amongst scientific workers of all types, one would imagine that the supply of text-books on the subject must be rapidly reaching saturation point. The last few years have seen the addition to the older established publications, such as Bowley's and Yule's text-books, of treatises ranging from the mathematical to the elementary, and varying widely in the methodological field they cover as well as in the type of scientific worker to which they are addressed. This latest recruit to the ranks aims at setting out briefly the actual processes of computing the more useful statistical constants, and reduces the discussion of the meanings of the values calculated, their limitations, and the underlying assumptions made to a minimum. It follows the usual and logical form of considering first the elements of tabulation and presentation, graphical as well as tabular, and then passing to the elementary constants of the frequency distribution, averages, dispersion, and skewness, while one-half of the book is devoted to the problems of sampling and the measurement of the significance of differences, and to the calculations of various forms of correlation coefficients. Each chapter includes a number of exercises on its subject matter.

There is not much that is new in the author's exposition though occasionally he has introduced some neat illustration or analogy to assist the reader to grasp the point—for example, in the change of origin in calculating the mean and standard deviation (p. 38), and in the pictorial presentation of the probable error of a mean (p. 98). His reversal of the usual order of the frequency distribution when written vertically seems merely liable to confuse, and to write every xy product in a correlation table is unnecessarily laborious without any compensating advantage. The book is well illustrated with examples fully worked out, and should prove a useful help to anyone who is in difficulties over the calculations of his statistical constants and is unable to digest the fuller discussion of their meaning to be found in other text-books.

NEW INVENTIONS

HEEL SUPPORT

FOR USE IN GYNÆCOLOGICAL WORK

THE advantages of this type of heel support is that it is relatively cheap and is inconspicuous when not in use. It can be easily attached to any examining couch. As is shown in the illustration, there are two wooden supports for attachment to the lower end of any examining couch, each support consisting of three flaps of wood joined by hinges in such a way that when in use one part is level with the couch, and acts as a heel support, and another part acts as a strut, fitting into a groove in the part attached to the leg of the couch. When not in use, the heel support is very easily slipped out of the groove and hangs parallel with the legs of the couch.

The appliance has been made for me by Messrs. Allen and Hanburys, Ltd., 48, Wigmore-street, London, W.1.

CECILE BOOYSEN, M.R.C.S. Eng.

THE LANCET

LONDON: SATURDAY, JULY 1, 1933

THE UNIVERSITY OF LONDON

WHO first said that there must be a University of London, being in any position to give importance to his words, is a matter of doubt, the honour having been claimed in several directions; but certainly five or six years before University College, London, came to life in Gower-street, both THOMAS CAMPBELL, the poet, who was a fine classical scholar, and the omniscient BROUGHAM had mooted the subject. At any rate, CAMPBELL'S scheme was taken up by BROUGHAM and JOSEPH HUME, economist and stalwart supporter of Catholic emancipation, while the poet himself alluded to the foundation of the University as the most important fact in his life. And now, nearly a hundred years after CAMPBELL'S death, HIS MAJESTY THE KING has laid the foundation-stone of central buildings for the University.

The history of the University during this considerable interval of virtually a homeless life has been a singular one, in that conflicting opinions as to its constitution, its policies, and its plans for development have been manifested over and over again, and yet the disputes, which have often been of an acrimonious quality, have not prevented academic progress. From its outset the University has been able to claim for the holders of its degrees a position second to none in the educational world, and to point to a steady and ever-increasing roll of graduates of the first distinction. The opportunity for the disputes lay in the constitution of the University. In theory this was a splendid one, for it designed to bring the attainment of a degree of high standing in all faculties within the reach of those who were able to satisfy the appropriate conditions, regardless of race or religion—a logical reaction to the restricting tests at Oxford and Cambridge. From the beginning a certain number of students received their training at two recognised colleges where the curriculum was standardised, but the number of students trained externally formed a great mass over the details of whose education the University exercised little supervision, the one thing needful for obtaining the degrees being that at appointed times and places the candidates should sit for and pass certain examinations. This situation made certain dissensions unavoidable. How they arose, and why the faculty of medicine was invariably and intimately involved, needs no re-telling, for every stage of the development of the University has been recorded profusely in a long story of commissions with different terms of reference, of assiduous work on the part of public men, of set-backs, and of triumphs over them. For unanimous effort was rendered difficult. To some the strengthening of the central organisation and the development of a topical character seemed the indicated road to progress, while to others this appeared to be a defaulting from the original conception. Such a fundamental cleavage affected material procedure, a fact which was reflected in the absence of an adequate central home for the University. A dignified building in Burlington-gardens was supplied by the State, but could not pretend to be much more than an examination hall, and the removal of the University to a section of the Imperial Institute only relieved the pressure of the situation, and this not too adequately. There was nothing which could be recognised as a focus of university life, or even as a visible symbol of its existence. Then a reconstitution of the University brought within its fold, in addition to the medical teaching schools, a large and mixed body of institutions of widely varying educational outlooks; and while many of these possessed their own domestic arrangements and machinery, the need for a central home for what was now the largest University in the world became obvious to everybody. But it was not until this need became public knowledge that the two great questions arose—where was that home to be, and where was the money to be found to bring it into existence? And until those questions were answered no beginning could be made.

The questions have now been splendidly answered, as the claims of the University of London, not only on the mother city, and not only on the empire, but on the whole thinking world, have become apparent. And the choice of the Bloomsbury site met this strong and far-reaching appeal in a wonderful manner, as a glance at the map on page 49 shows. For immediately surrounding the spot on which KING GEORGE has placed the foundation-stone of the new buildings are ranged already the centres of many important constituent activities; an original college of the University abuts, the British Museum stands on the southern border, the Record Office is near, and so are several of the most important medical schools, while all other bodies affiliated to the University will find their common home readily accessible. The site is an expression of that unity of endeavour which will conduce to the maintenance of the work of the University at its present enviable level, while providing full scope for the assured development. And on that site a magnificent outward expression of this unity will from to-day begin to rear its head.

THE VAGARIES OF THE COMMON COLD

A PARTICULARLY interesting field study of the "common cold" has recently been reported by J. H. PAUL and H. L. FREESE working under the auspices of the International Health Division of the Rockefeller Foundation.[1] A careful and detailed investigation has been made by them into the epidemiological and bacteriological characteristics over a period of approximately eleven months in a small isolated community in Spitsbergen. Longyear City, the scene of their activities,

[1] Amer. Jour. Hyg., 1933, xvii., 517.

has a population of some 500 persons, the majority of the men being occupied in coal-mining; its shipping season is from three to five months in length, depending on ice conditions, and during the remainder of the year there are no contacts with the outside world. Apart from the common cold communicable diseases seem rare.

During the period of observation the incidence of "common colds" was approximately one attack per person per year, an appreciably lower rate than has been reported by other workers for the temperate zone though not as low as that observed by MILAM and SMILLIE[2] on a small tropical island in the West Indies. Distribution of the cases by weeks showed clearly that they were largely concentrated into an epidemic period following the resumption of steamer traffic with Norway. Within a month of the arrival of the first boat about 75 per cent. of the winter residents had suffered an attack, while it is estimated that 90 per cent. had been involved before the epidemic died out. Local history has it that these epidemics never break out before the ships start to arrive and that there is no summer on record where the community escaped infection, though dispensary data indicate that the attack-rate and the severity of the disease vary from year to year. In the months of isolation only occasional cases of acute respiratory infections were observed and several abrupt drops in temperature (from 20 to − 10° F.) had no effect upon their prevalence. In fact no correlation could be established with any meteorological factors. The interesting point is that during the period of isolation occasional cases of "colds" occurred in every month but March, and yet no epidemic spread took place, though the explosive epidemic in May indicated that the community had by that time lost whatever immunity it had possessed. PAUL and FREESE suggest that perhaps this group of 500 persons was too small to permit the ætiological agent frequent enough transfers to retain its original potency. The steamers arriving in the summer, they observe, bring to the town not only the infective agent, but also a considerable number of susceptible persons. Once these persons cease to arrive there remains a community in which practically everyone has had one or more recent attacks. This, they suggest, may well be the critical period for the "virus," for only rarely will it find lodgment in a susceptible person. On the other hand the population of the town only rises in the summer by about 40 to 50 persons (not including tourists), and it might be doubted whether its composition with regard to susceptibles would vary sufficiently as to be so extremely effective in influencing epidemic spread. That it did not vary appreciably, between the period of isolation and the period of communication, in its nasopharyngeal flora was found by means of a special study of 140 persons, forming a fair cross-section of the population. The new arrivals of the summer of 1931 brought with them essentially the same nasopharyngeal flora as was found in the winter residents, the only exception being a slightly larger number of organisms of the Pfeiffer group. On the whole cultures from normal persons in Longyear City showed striking similarity to those obtained in the tropics and the temperate zone, the chief difference being that staphylococci and hæmolytic streptococci were virtually absent in the Spitsbergen population. Such observations are obviously consistent with the hypothesis that the final agent is a filtrable virus and that the bacterial flora played no important rôle in the initiation of the "common cold" epidemic.

In another investigation, carried out by J. A. DOULL, V. A. VAN VOLKENBURGH, N. B. HERMAN, and W. M. GAFAFER of the clinical laboratory of the John J. Abel Fund for Research on the Common Cold,[3] very little support is found for the opinion that minor respiratory diseases are more frequent and more severe in persons having some objectively demonstrable pathological condition of the upper respiratory tract than in normal persons. Groups of persons were classified on otolaryngological examination as normal and abnormal with respect to tonsils, adenoids, breathing space, turbinates, and maxillary sinuses. The total attack-rates were remarkably uniform for normals and abnormals, and subdivision of the abnormals according to type of abnormality revealed no material differences. Equally little difference is to be observed in the relative severity of attacks. So far as confinement to bed and general aching may be taken as criteria, attacks among abnormals were of approximately the same severity as those among the normals. On the other hand, among children the average duration of attack was longer for those with each class of defect than for those who were recorded as normal, and the study points to an apparently greater frequency of productive cough in those with abnormal turbinates and maxillary sinuses. Exactly what are the clinical characteristics of minor upper respiratory attacks and their frequency was a question to which early attention was paid by workers under the John J. Abel Fund. A further report on this aspect of the problem has been made by DOULL, HERMAN, and GAFAFER in the same issue of the *American Journal of Hygiene*, the population under observation being adult volunteers, principally medical students of the Johns Hopkins University. The incidence, approximately three attacks per person per annum, agrees with that observed in the previous study of Baltimore families, reported by VAN VOLKENBURGH and FROST, and the time distribution is strikingly similar—namely, minimal incidence during June and July, increasing to a sharp peak in September or October, to be followed by a succession of distinct epidemics. Fever was recorded in 21 per cent. of the total attacks and the severity of attack varied somewhat with season. Physical examination by an otolaryngologist in attacks occurring in 109 persons previously examined during health failed to reveal any characteristic pathological change. Emphasis is placed by the authors upon the fact that constitutional or toxic symptoms were present on the first day of illness in an appreciable proportion of

[2] Jour. Exp. Med., 1931, liii., 733.

[3] Amer. Jour. Hyg., 1933, xvii., 743.

attacks, which seems to indicate, as suggested by VAN VOLKENBURGH and FROST, that these toxic symptoms are manifestations of the primary reaction between the body and an invading micro-organism rather than of a secondary reaction between the body and commensals which have acquired pathogenicity.

Such studies as these add considerably to our knowledge of the various aspects of the common cold—clinical, epidemiological, and bacteriological. Our lack of control of its incidence is emphasised in a recent study by L. HOYLE into the effects of treatment of acute coryza by autogenous vaccines.[4] Lack of success with stock vaccines has been reported by various workers—e.g., FERGUSON, DAVEY, and TOPLEY[5]—and HOYLE reports but little beneficial influence of autogenous vaccines on frequency of attack though severity of attack showed some signs of response. His vaccines all contained pneumococci, *B. influenzæ*, and "mouse pathogenic green streptococci," and if an autogenous strain was not available a stock strain was included; hæmolytic streptococci and Friedländer's bacillus were only included when autogenous strains were available. The cases treated were persons who normally suffered from unusually frequent and severe attacks of coryza and a course of three injections was given at weekly intervals. Of 67 cases from whom satisfactory records were obtained 28 derived no benefit whatever, in 23 the incidence was unaffected but the severity was reduced, while 16 reported a definite reduction in frequency and severity. With no measuring rod for severity it is quite possible that subjective factors may play some part in this result, and herein lies some of the value of the more precise knowledge of the normal clinical characteristics provided by the American workers. Only with the aid of such knowledge and with adequate control groups can we hope to evaluate the numerous methods of prevention and cure put forward from time to time.

DIAGNOSTIC METHODS IN LATE PREGNANCY

SEVERE obstructed labour is rare in modern obstetric practice. This is due to improvement in antenatal and intrapartum diagnosis and treatment. But disproportion of minor degree is still often unrecognised before the onset of labour, and mistakes in diagnosis of presentation are not uncommon even in antenatal clinics, where examination of a succession of cases under leisured conditions should establish a routine so automatic as to prevent an abnormality from escaping detection. In private practice, however, various factors, mostly traditional and psychological, make it more difficult for the doctor to ascertain whether the child's head is the presenting part, whether the occiput is to the front, and whether the fœtal head is of a size likely to pass through the pelvis without undue delay. The patient's friends are quick to resent any repetition of an examination undertaken near the end of pregnancy lest it may undermine the patient's confidence, and are prepared with a reassuring list of friends whose "fussy young doctors" attempted to frighten them but who produced wonderful children without all these elaborate examinations and tests. The danger of loss of confidence is not indeed negligible; there are women who are so unnerved by the fear of prolonged labour owing to disproportion that they plead for Cæsarean section though the necessity for this has never really been established. But it is a far greater risk to neglect any opportunity of ascertaining in advance the lie of the child and the chances of an unaided delivery; and a doctor who explains to the patient, when he is engaged to conduct a labour, that he will only undertake it if allowed to make such periodical examinations as he thinks necessary and that these do not imply abnormality, is not likely to have trouble later.

What should his routine be—to what extent should he rely on pelvimetry, abdominal palpation, vaginal examination, or X rays? Prof. J. C. WINDEYER, in a copiously illustrated pamphlet on Diagnostic Methods Used during the Later Months of Pregnancy and during Labour,[1] gives practical advice which is more adapted to the need of the practitioner than the formal instruction set out in obstetric text-books, for he deals mainly with the information that can be gained from systematic abdominal palpation, and claims that if carefully performed this renders vaginal examination during labour unnecessary in 75 per cent. of cases. When it is necessary to determine the amount of dilatation of the os he advocates rectal examination, but this has certain disadvantages.[2] Vaginal examination should be made in every case of abnormal presentation or delayed engagement, just after the membranes have ruptured, to find out whether the cord has prolapsed; at other times abdominal palpation gives accurate information and is without risk to the mother. In abdominal palpation he lays stress on the importance of locating the anterior shoulder, which is felt near the midline in occipito-anterior positions, and about 3 in. away from it when the position is posterior. The anterior shoulder is 4 to 5 in. above the symphysis pubis before the head has engaged, and may be used in a trial labour as an indicator of the amount of descent of the head. In cases of posterior position anterior movement of the shoulder will show when rotation is taking place. Prof. WINDEYER marks the position of the shoulder on the abdominal wall with Bonney's blue antiseptic paint,[3] which he imagines (p. 14) to be an alcoholic solution of methylene-blue. A method of determining by abdominal examination the oblique diameter of the brim in which the head is lying is described. Most English text-books do not teach either this or the method of following the progress of labour by palpation of the anterior shoulder; both should be of particular interest and importance to the practitioner, who often

[4] Brit. Med. Jour., 1933, i., 996.
[5] Jour. of Hyg., 1927, xxvi., 98.

[1] Australasian Medical Publishing Co., Ltd., Sydney, 1933. Pp. 26. 1s. 6d.
[2] THE LANCET, 1930, i., 35.
[3] 1 per cent. solution of a mixture of crystal violet and brilliant green (equal parts of each) in 35 per cent. rectified spirit. See Text-book of Gynæcological Surgery, Berkeley and Bonney, 2nd ed., London, 1920, p. 35.

fears occipito-posterior presentations more than any other complications of labour. In palpation of the head to decide the amount of flexion he describes and figures the finger-tips, feeling the chin of the fœtus; but we doubt whether the chin can ever be felt, except in mento-anterior face or brow presentation. Prof. WINDEYER has his own method of determining whether there is any disproportion between the fœtal head and the pelvic brim, depending chiefly on estimation of the amount of overlap. He does not ignore, we need hardly say, vaginal examination; he advocates Munro Kerr's method for use when there is a possibility of disproportion. That more information can be obtained from vaginal, or combined vaginal and abdominal examination is not doubted, but the risk involved makes it less and less used when the patient is near or at term.

There remain pelvimetry and X rays, and these have the same drawbacks—that they measure bone and not flesh. Pelvic measurement, though of less import than direct comparison of head and pelvis, is useful in order to obtain at the earliest possible moment an indication of the probable course of labour. Prof. WINDEYER describes the usual external and internal measurements and advises that they should be estimated, if possible, early in pregnancy. He finds X ray examination rarely necessary, because the information can usually be obtained by other means, but he believes that with modern X ray methods one can accurately measure the brim of the pelvis and find out many other important details. Dr. JULIUS JARCHO, in a book reviewed on another page, while noting WINDEYER'S method of estimating disproportion, and his use of anterior shoulder of the fœtus, deals more fully with pelvic mensuration both by ordinary and radiographic methods. There has been much discussion on the value and limitations of X rays in pregnancy, some of the authors ignoring modern methods in which the apparent size of the shadows is corrected. Dr. W. C. DANSFORTH, writing in the most recent American work on obstetrics,[4] gives the following indications for the use of X rays in pregnancy: diagnosis of pregnancy, suspected multiple pregnancy, certain fœtal abnormalities, notably anencephalus and hydrocephalus, intrauterine fœtal death, face and brow positions, and post-maturity. He adds that X rays may be of use in helping the obstetrician to decide the question of immediate Cæsarean section or of test labour in cases of moderately contracted pelvis, and for the differentiation between pregnancy and pelvic tumour. Dr. DOUGLAS LINDSAY, writing in our columns a month ago,[5] would limit the usefulness of X rays in late pregnancy to the cases where obesity, a rigid or dense uterine musculature, an anterior thick placenta or excess of liquor amnii make palpation difficult; to the breech presentation in which, version having failed, the possibility of leg extension arises; to the determination of relative positions in multiple pregnancy; and to the confirmation of fœtal deformity. He quoted cases which illustrate the well-known danger of deducing disproportion from X ray findings in the absence of confirmatory evidence. Such evidence is obtainable by the introduction of scale measurements into X ray photographs. But as yet such complicated methods are useful mainly in research, and it will be long before the practitioner is in a position to subject all his patients to such an examination. Meanwhile the time-honoured method of abdominal palpation still holds as the most generally applicable and has the advantage that the patient accepts it without mental or physical disturbance, though to obtain really useful information the practitioner must develop a sensitivity of touch that only experience can give. If he desires to work out a technique of his own to this end, he will find in Prof. WINDEYER'S pamphlet a routine which could hardly be improved on.

[4] Obstetrics and Gynæcology. Edited by Prof. A. H. Curtis, M.D., Head of Department of Obstetrics and Gynecology, Northwestern University Medical School. Vol. I. London: W. B. Saunders Co., Ltd. 1933. Pp. 1165. 55s.

[5] THE LANCET, May 20th, p. 1061.

THE ANÆMIAS

THE present state of knowledge in regard to the anæmias was reviewed at the Summer Meeting of the Association of Clinical Pathologists, held in the pathological department of the Ancoats Hospital, Manchester, on Saturday, June 24th. Papers were read dealing with pernicious anæmia, anæmia of the so-called secondary types, and the anæmia of sprue, and evidence was produced that, thanks to the advances in knowledge in the last few years, all these anæmias are now definitely remediable. In the case of pernicious anæmia it is perhaps incorrect to speak of "cure," and the same applies, though to a lesser extent, in the case of some of the "secondary" anæmias; but in all it is now possible, once a correct diagnosis has been made, to restore the patient to health, and under suitable treatment to maintain him there. Correct diagnosis, however, can only be made by laboratory methods. In the discussion attention was drawn to the deplorable wastage resulting from failure both in correct diagnosis and the application of efficient treatment. This wastage involves material in the prescription of expensive preparations, particularly of liver, to unsuitable cases, and in the use of highly priced preparations of low potency; it involves human efficiency, since many patients remain in states of debility who with proper treatment might be in good health; and it involves human life from failure of correct diagnosis and appropriate and efficient treatment. It was pointed out that the National Health Insurance Acts are largely ineffective in remedying this wastage, owing to the fact that they provide for treatment only and make no provision for diagnosis or for the laboratory examinations necessary for the maintenance of health in cases of anæmia. At the conclusion of the meeting the following resolution was passed: "This Association is of the opinion that the failure to provide laboratory facilities for the examination of the blood in the case of patients under the National Health Insurance Acts suffering from or suspected to suffer from anæmia, is responsible for much wastage both of material and of human efficiency and life, and considers that centres should be established at which such laboratory service be available both for initial diagnosis and for the periodical examinations necessary to assure the maintenance of a sound state of health."

ANNOTATIONS

SEASONAL GROWTH AND HUMAN HIBERNATION

IT has been clearly shown that the rate of growth in children is far from being evenly spread over the calendar year. Constant seasonal variations have been demonstrated beyond doubt: thus weight is found to be added most quickly during the late summer and autumn, much more slowly during the winter, and most slowly of all in the spring and early summer. This cycle has been observed in children of various nationalities; in Copenhagen and in Stockholm, in Aberdeen and Berlin, in Boston and New York. For instance, to quote but one example, Orr and Clark [1] found that children in Scotland gained weight most rapidly during September, October, and November, and that the increase fell to a minimum during the spring and summer. Further confirmation is now provided in a careful study reported by Dr. Carroll E. Palmer, of the United States public health service.[2] Under the supervision of the medical officers of the service about 2500 native-born white children attending the elementary schools of Hagerstown were weighed monthly during the school years 1923 to 1928. The same maximum rates of average growth in weight during the autumn, the intermediate rates during the winter, and the minimum rates during the spring were observed in both sexes and, with remarkable constancy, for each yearly age-group from the sixth to the fifteenth year. There can be no doubt of the widespread existence of this cyclic phenomenon; the problem, therefore, lies in its interpretation. Palmer finds no indication in his data that it is in any way related, as has been suggested, to the presence or absence of infection or other sickness. Comparison of the seasonal curve of monthly growth-rates with the seasonal curve of sickness-incidence gives no evidence of correlation. On the other hand, it is shown by the observations of A. B. Fitt, in Melbourne,[3] that these variations in physiological activity must clearly be associated in some as yet unexplained manner with the seasonal changes. For the children of English stock in Melbourne also show their major growth in weight in the autumn months, that is in the autumn months of the southern hemisphere (April, May, and June), and a far slower rate of increase in the spring (October, November, and December). In March to July the average increase in weight each month was nearly 1 lb. as compared with only ¼ lb. in August to December. As regards height, the position seems to be reversed, though the differences are on a much smaller scale. In explanation of his observations Fitt develops the somewhat bold hypothesis that man carries with him to-day "an energy-rhythm from previous glacial or other periods when hibernation, either complete or intermittent, similar to that of the polar bear, was absolutely essential to man's survival through a strenuous winter when food-supplies were very scant." The weight-activity in the growing child in the autumn corresponds with the life of many hibernating animals, which eat vigorously and put on much weight before sleeping through the winter. The height-activity, which is observed in the spring months, Fitt compares with the effective conception-rates for the Commonwealth which show a seasonal upward movement at the same period of the year. This, he suggests, is in reality the same rhythm, a rhythm of cell-reproduction, the one an increasing activity in cell-reproduction of a certain kind (tissues of bone, muscle, sinew, &c., going with increased stature), the other an increased cell-activity in relation to the sex-cells. Similarly he finds a correspondence between the seasonal curve of mental concentration in school-children and that of the suicide-rate, both showing a higher level towards the spring, and both, he argues, depending greatly on the same factor, the presence or absence of mental stability. On the basis of these seasonal trends he elaborates his thesis that the same energy-rhythm through which the life of hibernating animals runs remains with man as the main determining factor in his life's activities, whether of the growing child or the grown adult. The hibernating is a period of quieter activity, followed by "the rousing with the on-coming of spring, a rousing which is not merely a mechanical, physical process, but a highly emotional one as well, associated with the demands of the reproductive instinct, characterised by haste, restlessness, and a high measure of instability.... This phase continues through the spring and summer until later, with autumn or thereabouts, the consolidating, quieter phase sets in." The two phases of the year's rhythm thus represent qualitative as well as quantitative differences, and "shows man to be still a creature of the sun, dependent upon its course through the seasons. Complex, and inheriting an energy-rhythm which really means an internal division of labour, he can still (without serious detriment) reach his maximal achievement in any one field only when nature orders it." This is an interesting hypothesis which, hard as it is to prove or disprove, demands further study. Correlations in time—e.g., of reproduction and increase in height—are notoriously difficult to interpret; there are without doubt innumerable factors having their influence upon such variables as the birth- and suicide-rates. The problem is to isolate these influences, to see how far one basic common factor, as Fitt believes, can be held responsible for the seasonal rhythm in such apparently widely removed phenomena as the growth of children and the reproductive-, the suicide-, and the death-rates of their progenitors.

[1] Orr, J. B., and Clark, M. L.: THE LANCET, 1930, ii., 365.
[2] U.S. Pub. Health Rep., 1933, xlviii., 211.
[3] Rep. 16th Meeting Australasian Assoc. for Advancement of Science, 1924, xvi., 704.

DIGITALIS IN ACUTE TOXÆMIAS

THE cardiac failure of diphtheria is not usually treated with digitalis, because the electrocardiographic changes caused by poisoning with the drug are similar to those brought about by the toxin. It may be, however, that this question requires reconsideration in view of the work of F. F. Schwentker and W. W. Noel,[1] who distinguished between early cardiac failure, a result of the initial general toxæmia, and late cardiac failure, which is characterised in part by arrhythmias and heart-block due to irregularities in the process of repair of the conductive apparatus. On the value of digitalis in lobar pneumonia clinicians differ. G. N. Myers [2] carried out a number of experiments on guinea-pigs with results that seemed to show that it has a protective action against poisoning by diphtheria toxin, and he argued by analogy that it would give similar protection in the toxæmia of pneumonia. He found that daily subcutaneous injections of digitalis for several days before and

[1] Bull. Johns Hopkins Hosp., 1929, xlv., 276.
[2] THE LANCET, 1930, ii., 916; 1931, i., 1239; Jour. Pharm. and Exp. Therap., 1932, xliv., 191.

after injection of diphtheria toxin protected guinea-pigs almost completely against doses of toxin in excess of those ordinarily lethal. But H. Gold, M. M. Klumpp, and T. D. Slagle [3] criticise these observations and conclusions. They have repeated the work on the cat, an animal which they believe to be more like man in its response to digitalis bodies than rodents. The experiments were carried out upon 59 cats, which were very carefully tended to ensure that their general health was good, and every care was taken to prevent deterioration of the sample of diphtheria toxin used. After suitable fresh dilution the toxin was as a rule injected intravenously, and the fact that a control group of cats received an identical dose of toxin at the same time as the digitalis series served as a check upon any possible loss of potency of the toxin. A tincture of digitalis which had given satisfactory therapeutic results in a large cardiac clinic was employed throughout. Its potency was 0·9 per cat unit and this was regarded as the average fatal dose. An examination of the survival periods and the degree of gross cardiac damage in the controls and test animals provided no evidence of antagonism of digitalis to toxin: pericardial and endocardial hæmorrhages were seen in the hearts of both groups, and the investigators conclude that digitalis not only fails to protect the cat against diphtheria toxin but in very large doses actually hastens its death. They think it is probable that the same is true in man. With regard to the use of digitalis in pneumonia, Gold and his co-workers draw attention to the findings of the pneumonia committee of the Bellevue Hospital in New York City recorded by J. Wyckoff and others.[4] In an intensive study of about 1000 cases of lobar pneumonia, these workers found no evidence that the routine use of digitalis is useful. They think that when auricular fibrillation or flutter occurs, as it does in less than 5 per cent. of cases of pneumonia, digitalis may perhaps save life, although patients frequently recover without it; but they believe that routine digitalis therapy in lobar pneumonia is dangerous.

NATIONAL BABY WEEK

WHEN the first Baby Week was held in 1917 its object was to advertise the fact—not then realised by the man in the street—that the greater proportion of infant mortality and morbidity was preventable. The immediate aim of the National Baby Week Council at that time was to promote administrative measures for the prevention of disease amongst children, and the late Lord Rhondda, who was then its chairman, was extremely active. Since those days the administrative scheme has been consolidated by a succession of Maternity and Child Welfare Acts, more especially the Act of 1918, and now there are only comparatively small gaps in the general scheme to be made good. Nevertheless the National Baby Week still serves as the occasion for drawing attention to certain special problems which remain urgent. In arranging the celebrations next week, the Council has taken the present financial difficulties into consideration and is concentrating on measures which it believes may be carried out without much monetary outlay. One of these is an attempt to find means for preparation for parenthood, and another is to enlist the help of fathers in the welfare movement, by the formation of "fathers' councils." These two problems are being put before the public in a variety of ways which it is hoped will secure general coöperation. One of the outstanding features of the week's arrangements is, of course, the annual Conference on Maternity and Child Welfare which, as we have already announced, is being held at the Friends House, Euston-road, London, from July 5th to 7th. This is the sixth of its kind to be organised by the National Association for the Prevention of Infant Mortality, a body which coöperates very closely with the National Baby Week Council, and the proceedings will include discussions on the scope and advancement of antenatal care, the protection of illegitimate children, and the health of the child in relation to its environment. The Council also encourages the spread of knowledge of mothercraft by offering challenge shields to the municipalities which organise the best Baby Week programme. Included in these municipal programmes are mothercraft exhibitions, competitions, lectures, film displays, and other educational expedients for the enlightenment of parents on upbringing of their children. Apart from these local events, the Council also offers prizes to school teachers, health workers, school-children, and others, for the best suggestions for useful propaganda work. Many different interests are thus attracted to the cause of child welfare.

POSTURAL VARIATIONS IN INTRACRANIAL PRESSURE

THE intracranial pressure is by no means so simple a subject as was formerly supposed. The Munro-Kellie doctrine, as formulated over 100 years ago, ignored the presence of cerebro-spinal fluid within the cranium and argued that, as the latter was rigid and the brain incompressible, the blood volume inside the cranium must remain constant. Later it was recognised that variations in the quantity of intracranial blood might be compensated by variations in the intracranial cerebro-spinal fluid. But it is only within the last few years that it has been possible to find a physical formula which is applicable to this variation. Lewis H. Weed [1] has investigated the pressure and displacement of the cerebro-spinal fluid in cats, dogs, and monkeys, and has found that the elasticity of the cranial contents—that is, the quotient of the stress by the strain—was constant for the great majority of animals of the same kind and the same age in any position of the cerebro-spinal axis. He considered that this elasticity was chiefly a function of the blood-vessels and was closely related to vasomotor tone, since in animals examined immediately after death, when the blood is still fluid, it is found that the variations in pressure consequent on alterations of posture are nearly twice as great as in the living animal. It is this elasticity which makes the cerebro-spinal fluid pressure, as measured during lumbar puncture, much greater in the sitting than in the horizontal posture. If there were no elasticity the pressure in these two positions would be identical, whereas if the skull were easily compressible or the intracranial blood-vessels infinitely distensible, the fluid in the lumbar manometer would always rise above the level of the head. Actually the increase in the pressure reading on rising from the horizontal to the sitting posture is only one-third to one-quarter of the distance from the lumbar needle to the vertex of the brain. Thus the level of zero pressure in the cerebro-spinal system in the erect posture corresponds to the upper thoracic vertebræ.

This partial vacuum inside the skull in the erect posture has only been recognised of recent years,

[3] Amer. Jour. Med. Sci., April, 1933, p. 509.
[4] Jour. Amer. Med. Assoc., 1930, xcv., 1243.

[1] Bull. Johns Hopkins Hospital, May, 1933, p. 345.

but it may be of considerable functional importance. Weed's observations suggest that its action on the blood-supply to the brain may resemble somewhat the suction feed of petrol to a modern motor engine, ensuring an adequate supply and safeguarding the brain from the effects of any rapid fall in arterial pressure. He draws attention to the fact that a craniotomy removes this safeguard so that rapid alterations of the position of the body are less easily compensated. The clinical implications of this work have not yet been fully studied, but it obviously has important bearings both on cerebral surgery and on the treatment of traumatic and vascular lesions of the brain.

EXPERIMENTAL EMBRYOLOGY AND THE NERVOUS SYSTEM

THE nervous system is early laid down and elaborated in the growing embryo, and early shows a high degree of regulability and dependence upon internal factors. For these reasons the methods of experimental embryology have had peculiar success in the study of the many problems presented by nervous structure and function. Prof. Ross G. Harrison chose this subject for his Croonian lecture before the Royal Society on June 29th and described many interesting observations on the embryo which have enlarged our knowledge of neurology. The old controversy as to whether form determines function or function form has received a striking contribution from the fact that complicated neuro-muscular mechanisms are completely laid down in the vertebrate embryo long before they begin to work. In the amphibian, where they work much earlier, their activity can be suppressed by means of chloretone without in any way interfering with their development. Embryological study also played an important part in the establishment of the cell theory, or in more technical words, the neurone concept; in the amphibian embryo it was shown that ganglion cells were essential while sheath cells were not, thus indicating that the nervous units are autonomous. The growth of nerve-fibres from the cell by means of amœboid acitivity has been actually watched in tissue-culture, and this experiment settled the question of whether fibres grew out from the young neuroblast or were the result of differentiation of pre-existing protoplasmic bridges. The outgrowth is more or less haphazard, but can be controlled by altering the structure of the fibrin clot in the culture medium and so producing tension. In this way the outgrowing fibre can be persuaded to form plexuses. Chemical stimuli, however, have not yet been shown to exert any influence on the growing fibre, although theoretically they would seem most likely to play a part. In the living embryo the course and final fate of the outgrowing fibre is determined by the peripheral structures which it meets, as is interestingly shown by limb-grafts. If the limb of a large salamander is grafted on to a small salamander, the nerve-supply of the limb is provided by the host, but its arrangement is that of the animal from which the grafted limb came—i.e., the nerves are correspondingly large, the sensory nerve-fibres and spinal ganglion cells being actually increased in number while the motor nerves are adjusted by more frequent division than usual of the small salamander's axones. There seems to be some kind of attractive influence from the periphery; when a limb is shifted forward or backward on the animal the nerves normally supplying it tend to converge upon it. If a limb is prevented from developing, its spinal ganglia show hypoplasia, but if a limb is grafted out of place the ganglia show hyperplasia. The motor centres are not similarly affected, though the size of their cells may be reduced or increased. Thus hyperplasia and hypoplasia are the result of incoming rather than of outgoing influences, and the developing nervous system responds to a great variety of changed conditions. Further study along these lines will surely yield fruitful results.

ARTHRITIS

So much has been written about rheumatism in the last few years that few would care to say which views have been justified and which discredited. The British Medical Association's committee have done a real service in producing a short report[1]—no more than 19 pages—on the causation and treatment of arthritis and allied conditions, which gives a clear, balanced, and comprehensive survey of our present knowledge of this important group of diseases. In addition they survey the national schemes for treatment already in practice in Holland, Germany, and Sweden, and set out a suggested scheme for Great Britain together with proposals for future research. The persistence of theories which have no valid foundation is an obvious bar to progress, and the committee have done their best to bring the facts into the light of day. They point out, for example, that the idea that arthritis is due to an excessive accumulation of lactic acid in the body is now regarded as incorrect and that the lactic acid in the blood, urine, and sweat of arthritic subjects shows no material variation from that seen in non-arthritics. Further, they say that an acid reaction of the skin is found in non-arthritics as well as in arthritics, and the change in the reaction of the skin during a hot-air or vapour bath is a normal physiological process. Again, the division of rheumatic disease into two groups, according to an acid and an alkaline diathesis, gains no support from well-controlled experiments. Since R. Pemberton, of Philadelphia, and his co-workers showed that a majority of rheumatoid arthritis patients have a definite glucose intolerance, this finding has often been interpreted as due to a defect in the pancreas. This interpretation, however, is incorrect because, as Pemberton emphasises, the defect is in the tissues themselves and in their blood-supply, and owing to vasoconstriction the tissues absorb and store glucose at a reduced rate. The committee draw attention to the very real value of manipulation in cases of arthritis—a form of treatment not nearly as widely used as it should be. They remark that "the reputation enjoyed by certain irregular practitioners might be reserved for the medical profession if a greater interest were taken in this branch of therapeutics and were technical skill in these methods more widely distributed." A section of the report which will be particularly helpful to many is the one dealing with mineral waters and baths. It is customary to recommend one spa more than another, but in the recommender's mind there is not always a clear idea why a certain patient will receive more helpful treatment at A rather than at B for his particular complaint. Here we have a short description of the chemical content of the various waters with an indication as to which form of rheumatism will be likely to benefit from which type of mineral water. It is somewhat depressing to note what a large part orthopædic and surgical measures play in

[1] Brit. Med. Jour., June 17th, p. 1033.

the treatment of arthritis, and it is to be hoped that as time goes on the emphasis will shift further away from them.

THE OLD ASHMOLEAN

A SECOND and greatly enlarged edition of a Guide to the Historic Collections of Scientific Instruments and Kindred Objects, in the Old Ashmolean at Oxford, has been prepared by the curator, Dr. R. T. Gunther, and was issued on the 250th anniversary of the opening of that museum by the Duke of York on May 21st, 1683. The earlier edition, which appeared under the title of "Historic Instruments for the Advancement of Science" and was reviewed in THE LANCET for Jan. 2nd, 1926, dealt principally with the Foundation Collections given to Oxford by Dr. Lewis Evans in 1925, which were principally mathematical and astronomical and did not include many items of medical interest. It served, however, as a nucleus round which has gathered scientific material of all kinds, though principally relating to work done in Oxford. Among these accessions are the Clutton Collection of Materia Medica, comprising 1032 specimens purchased from Joseph Clutton, of Holborn, for £21 6s. 8*d*. in 1729, perhaps the oldest intact collection of its kind of ancient date in the world, and the even earlier teaching collection of physical drugs, formed by John Pointer, of Merton College, and used by him for instructional purposes about 1715. The series of microscopes on exhibition includes many of special interest from the facsimile of the original Hooke instrument about 1665, by means of which cellular structure was first recognised and delineated, to more recent types of achromatic instruments, such as the Pillischer stands used by Sir Henry Acland when, with Victor Carus as his demonstrator, he introduced the practical teaching of histology and microscopic anatomy into Christ Church, and so into Oxford. Of special value is the picked series of achromatic object glasses by the best makers, specially chosen by Mr. E. M. Nelson to illustrate the principal stages in the evolution of this essential adjunct to the microscope. A typical collection of instruments drawn from the duplicates in the collections of the Royal College of Surgeons of England is now being extended by more recent acquisitions from the Radcliffe Infirmary and from private sources. So that in time Oxford may also come to possess a select, if not a large, collection of historic surgical instruments. And thus may be materialised for the first time in two and a half centuries the intention of Elias Ashmole, the founder of the museum: "Because the knowledge of Nature is very necessarie to humaine life, health and the conveniences thereof, and because that knowledge cannot be soe well and usefully attain'd, except the history of Nature be knowne and considered; and to this, is requisite the inspection of particulars, especially those as are extraordinary in their Fabrick, or usefull in Medicine. I Elias Ashmole, out of my affection to this sort of Learning, wherein myselfe have taken, and still doe take the greatest delight; for which cause also, I have amass'd together great variety of naturall Concretes and Bodies, and bestowed them on the University of Oxford."

ANIMAL RESEARCH IN TROPICAL MEDICINE

THE necessity of animal research for the progress of medical and veterinary science has been accepted, however unwillingly, by most of those who have to treat sick men and beasts. Nevertheless, so long as there are people who try to stop this important work so long must the annual Stephen Paget memorial lecturer repeat the story of our indebtedness to experimental science. Sir Leonard Rogers, delivering the seventh lecture on June 22nd, declared boldly that more specific curative remedies for serious widespread disease have been discovered by animal experiments in about 30 years than accrued from 3000 years of empiricism, and illustrated his thesis from the field of tropical medicine. As the result of a few almost painless experiments, he said, the success of permanganate of potash in saving the victims of snake-bite was established, but even these experiments were postponed for nearly 30 years by the efforts of anti-vivisectionists, to whose door must be laid the deaths of an uncounted number of victims of snake-bite in the interval. The case-mortality of cholera has been reduced from 59 to 20·8 per cent. by the use of intravenous injections and permanganate pills, the clue to the use of the pills having been furnished by those same experiments which went so far towards solving the terrible problem of snake-bite. Moreover, it is now possible to protect altogether a very large proportion of inoculated subjects. The only specific curative treatment for bacillary dysentery is the antitoxic serum obtained through the horse, while amœbic dysentery, and associated liver abscess, can now be treated scientifically as a result of experimental work. The modern methods of attacking plague are based on experiments with vermin on whose destruction large sums are annually expended, yet the opponents of vivisection would apparently prefer their rats and mice to be exterminated by poison or gas rather than that a few of the doomed should die painlessly in a laboratory for the salvation of thousands of men, women, and children. Sir Leonard showed how during the European war enteric fever was displaying an alarming tendency to spread until the heroic propaganda work of Stephen Paget induced the soldiers to submit voluntarily to the preventive inoculation which would have been made compulsory but for the agitation against it. The modern compounds which are giving us the upper hand in the fight against sleeping sickness, which has for many years been decimating Africa, are largely due to experiments on rats and mice, and similar researches have provided the means of eradicating kala-azar, which carried off one-third of the population of the Brahmaputra valley of Assam in the course of 30 years. And so the story goes on, through bilharziasis, hookworm disease, and malaria, to the many diseases of animals themselves which have been mastered as the direct result of animal experiment. Sir Leonard mentioned rinderpest, hæmorrhagic septicæmia of cattle, blackquarter, anthrax, swine erysipelas, and distemper to show the debt of animals to experimental work. It must certainly be held unreasonable to dispute the fact that beasts as well as man have been saved much suffering by this work.

THE third International Congress for Experimental Cytology will be held at Cambridge from August 21st to 26th. The international president is Dr. Theodor Huzella, professor of anatomy in the University of Debreczen, in Hungary, and the local president Mr. James Gray, F.R.S. The main subjects of discussion will be cell respiration and cell metabolism, cell form and function, the electrophysiology of the cell, Entwicklungsmechanik und Explantation, and the cultivation of animal and plant viruses. The local secretary is Miss Honor Fell, D.Sc., Strangeways Research Laboratory, via Cherryhinton, Cambridge.

POST-GRADUATE LECTURES

A COURSE of lectures was held at St. Bartholomew's Hospital on Friday and Saturday of last week for the benefit of old students of the hospital and other members of the medical profession. The following are summaries of three of those delivered.

TOXIC GOITRE AND ITS TREATMENT

(PROF. F. R. FRASER)

As a result of investigations that are being pursued in many countries it is becoming possible to obtain a clearer picture of the natural history of toxic goitre and of other disturbances of the thyroid gland, and it is becoming possible to correlate the various clinical types of toxic goitre and to view them as examples of one disease process.

Clinical types.—The disease includes such various types as (1) adolescent goitres with slight nervousness and tachycardia; (2) the single attack of typical exophthalmic goitre with recovery, and the return of the thyroid gland apparently to normal; (3) the relapsing or chronic form of exophthalmic goitre; (4) a simple goitre, colloid or nodular, with evidence from time to time of toxicity, tachycardia, loss of weight, and nervousness; and (5) the long-established goitre, nodular and fibrotic, in middle-aged women with auricular fibrillation and congestive heart failure, but without the classical signs of exophthalmic goitre.

The disease process.—Largely through the work of Marine we believe that the thyroid gland responds to a variety of stimuli, which occur in the ordinary life of the individual, by increased activity, and that if the stimulus is great relatively to the capacity of the gland, the gland responds with hypertrophy and hyperplasia, and loss of colloid. When the stimulus ceases the gland involutes and returns to the normal resting state with colloid storage. Chesney and Webster studied this process of involution in rabbits, in which the hyperplasia was the result of a cabbage diet, and in which the involution was brought about by the administration of iodine. The goitre was simple—that is to say, signs of toxicity were absent. Sometimes the process of involution did not result in a return to the normal structure throughout the gland, but areas of hyper-involution were seen in which the gland follicles were distended with colloid as in a colloid goitre, and even colloid cysts were formed. Reinhoff studied the involution that resulted when iodine was administered to patients in a first attack of exophthalmic goitre, and he showed that when the remission occurred as a result of this treatment the involution process was not always homogeneous but that there occurred areas of hyper-involution with colloid distension, and also areas of hyper-involution with the gland substance continuing in a state of hyperplasia. Around these localised areas of hypo-involution or of hyper-involution the gland structure was compressed and the cells of the follicles atrophied, so that fibrous tissue surrounded the area and produced an appearance as of a capsule. These observations and many others with similar results suggest that when the thyroid gland responds to stimuli, as it certainly does repeatedly in the life of an individual so that increased activity results, it usually involutes when the stimulus ceases and returns to the normal resting condition but that in certain individuals the involution is faulty, and that if repeated hyperplasia and faulty involution occur nodules and fibrosis result.

A number of stimuli are known that cause the gland to respond with increase of activity and with hypertrophy and hyperplasia such as infections, faulty diets, activities of the sex organs, and iodine deficiency, but why the increased activity should sometimes be accompanied by evidence of toxicity we do not know. A gland that from its nodular structure shows evidence of repeated stimulation with hyperplasia, followed by involution on many previous occasions but without there being any history of toxic goitre, may at some later time respond to some stimulus and the patient then for the first time show signs and symptoms of toxicity. On the other hand, a gland that shows no evidence of previous trouble may respond to some stimulus with enlargement and hyperplasia, apparently for the first time, and the patient may show all the classical signs of exophthalmic goitre.

Course of the disease.—The course of toxic goitre may be a single flare of toxicity with recovery after a period of weeks or months and a return to health, but more frequently it is a series of flares of varying severity, separated by partial remissions. From the point of view of prognosis and treatment it is clearly important to determine whether the patient at any given time is in the stage of relapsing or in the stage of remitting. The disease may prove fatal in one of two ways. The first attack or any of the repeated relapses may be so severe as to cause death, and if a series of relapses continues over a period of years the organs of the patient, especially if elderly, give way under the strain and death results, most frequently from heart failure.

The symptomatology is notoriously variable but if, as Dunhill has pointed out, the variations in the stimulus, the variations in the capacity of the gland to respond to the stimulus, and the variations in the organs and tissues of the patient to withstand the strain are considered, much of the variety in symptoms can be accounted for. Even when all these variable factors are considered there are still many clinical features of the disease, such as the variability in exophthalmos and other eye signs, that cannot be satisfactorily explained.

Treatment.—Although the cause of toxic goitre is not known the exacerbations and relapses are so commonly associated with certain conditions that these must be regarded as at least subsidiary causes of the disease. Activities of the sex organs, such as occur at puberty and at the menopause, infections, especially tonsillitis and psychic disturbances, such as long-continued family troubles and financial worries, are the most frequently met with. Psychic disturbances associated with marital and sexual difficulties appear to be especially potent. But such apparently causal factors in this disease are events that occur in the lives of numerous individuals who do not develop toxic goitre, and so it seems necessary to postulate a constitutional factor. The presence of toxic goitre in both mother and daughter or in more than one member of the same generation in a family has been noted sufficiently often to support the hypothesis of a constitutional factor that can be inherited.

It may be because of this constitutional factor that a complete cure is so seldom attained, and a patient who has had toxic goitre must be guarded and guided through life and especially when worries, infections, pregnancies, and the menopause occur.

During an attack or a relapse every effort must be directed to bring about a remission, and the most important factor for this purpose is rest. Even if treatment by thyroidectomy is to be employed the operation risks are least during the stage of remission. The rest must be physiological and psychic as well as physical, and much thought and care must be expended on the details if the best results are to be obtained. If any subsidiary cause can be identified it must be removed if possible. Iodine should be given, for although it does not cure the condition or alter the course of the disease, it enables the disease to run its course at a lower level of severity.

If the response to treatment on these lines is not satisfactory after a few months or if the case is of the chronic or relapsing type, some method of treatment to reduce the amount of functioning gland tissue is necessary, unless the toxicity is very slight. The methods available are thyroidectomy or irradiation by X rays or radium. Subtotal thyroidectomy is the most certain and the quickest of these methods, but the mortality of this operation is not negligible even in the hands of experienced surgeons. On the other hand, irradiation is uncertain in the ultimate result and it may take many months to produce the benefit that subtotal thyroidectomy brings about in a few weeks. If a surgeon with continuous experience of operating on the thyroid gland is not available, the slower methods must be considered, especially if the toxicity is not sufficiently severe to interfere with the livelihood of the patient, or the economic circumstances of the patient do not require an early return to efficiency. If the thyroid gland is nodular the methods of irradiation are less likely to succeed and thyroidectomy is more necessary, and if auricular fibrillation occurs thyroidectomy is the only satisfactory method of treatment. In the present state of knowledge if rest, iodine, and the removal of subsidiary factors do not bring about a successful result in six months, surgical treatment is the most satisfactory, but it should only be advised if a surgeon of experience and skill is available. By subtotal thyroidectomy the patient is frequently returned to full efficiency and at the least will not be liable to dangerous relapses in the future, but in most instances something abnormal persists and the physician must continue to guide and to guard through the troubles and accidents of life.

ANÆSTHESIA AND ANALGESIA IN LABOUR

(MR. JOHN BEATTIE)

UP to the present no ideal drug or combination of drugs for administration during the whole time or any part of the time during labour has been discovered. The experienced obstetrician will vary his method of producing relief from labour pains according to the temperament of the patient, the number of pregnancies she has had, and the type of pains during the first stage of labour.

Anæsthetics and analgesics in midwifery practice are used (1) for purely medical reasons—i.e., to facilitate delivery under conditions of greater or less abnormality, and (2) for partly medical and partly humanitarian reasons—i.e., to relieve or abolish the pain associated with normal labour.

In view of the present public demand for relief from the pains of childbirth, it must be emphasised that a woman who insists on complete relief is running an increased risk unless gas-and-oxygen is used which is impossible in the average case. On the other hand, when a patient feels the uterine contractions to be intolerable, and becomes excited, the use of anæsthesia is of great value in assisting a normal delivery.

GAS-AND-OXYGEN

If the surroundings are suitable, the obstetrician has time, and the patient can afford to have a midwife in attendance, it is possible to offer substantial relief to the patient. If complete relief is demanded the safest method is to administer gas-and-oxygen over a long period. This method requires a whole-time expert anæsthetist and the total cost is prohibitive for many patients.

But the great advantages of the method are: (1) safe administration for any length of time; (2) complete relief from second stage pains, and if necessary, from most of the first stage pains without any deleterious effect upon uterine contractions; (3) the addition of a little ether when the head is being born will greatly assist the obstetrician in the control of the head and in the preservation of the perineum; (4) the third stage of labour is terminated while the patient is still under the influence of the gas-and-oxygen, and the judicious use of a little carbon dioxide may make the patient cough and deliver the placenta out of the vagina; (5) the anæsthetic never produces any adverse effects on the child; (6) the anæsthetic is not unpleasant to take; (7) its depth can be altered at will, and the addition of ether quickly produces full surgical anæsthesia. The apparatus (Boyle's machine) can be obtained in portable form. In order to cut down the time which the anæsthetist must stay at the bedside, it is possible to administer morphia or other sedative drugs in the first stage, and use gas-and-oxygen in the second stage when the pains become more severe.

CHLOROFORM AND ETHER

Chloroform and ether in various mixtures have the disadvantage that the anæsthetic once started cannot well be discontinued, and therefore considerable skill is required in judging when to start it. If too much chloroform is given pains may cease. The nervous woman who becomes hysterical over first stage labour pains cannot be given chloroform or ether owing to the length of time for which the drug would have to be administered. Too early administration of ether and chloroform in the second stage often results in the unnecessary delivery by forceps. If deep surgical anæsthesia is required it is advisable to change to ether if pure chloroform has been used. In no circumstances should more than 6 drachms of chloroform be used, and as a rule much less. Chloroform or a mixture with ether can be given by an efficient midwife towards the end of the second stage of labour.

Self-administered chloroform in a modern fool-proof Junker's inhaler is a very good method of producing analgesia during uterine contractions, the patient receiving a minimum of anæsthetic.

Chloroform ampoules have recently been suggested as a method of producing partial anæsthesia during the second stage of labour suitable for the use of midwives working without a doctor, but in my view it is very doubtful if they are suitable for this purpose. In the maternity ward of this hospital I have found the method very satisfactory in some cases, but of little use in others. One is supposed to know when to break another capsule by smelling the mask to see if the chloroform has been used up. This technique alone is open to considerable error and one can well imagine a patient obtaining too much chloroform, even though it is laid down that not

more than 6 to 10 ampoules are to be used for any one case. In the hands of a qualified man, the capsules have little advantage over the mask or the Junker.

Ether may be used alone upon a mask, but its irritant effect and unpleasant smell make the patient restless, and with the very excitable woman the method is worse than useless.

GWATHMEY'S METHOD

Gwathmey's method, described in 1924, depends upon the induction of hypnosis as soon as the second stage of labour begins followed by amnesia by the use of drugs whose actions are complementary—namely, ether and magnesium sulphate.

The sedative action of morphine sulphate gr. ¼ subcutaneously is prolonged and increased by the injection of magnesium sulphate. When this sedative action wears off an alcoholic and oily solution of ether and quinine is given per rectum, and then a further hypodermic injection of magnesium sulphate is given. The patient is supposed to sleep between pains for two to four hours after which complete consciousness returns.

One or two further quinine enemas may be given, with the object of counteracting the depressant effect produced by the morphia and ether. Gwathmey used this method in about 20,000 cases and claims success in 85 to 97 per cent. of cases without maternal or fœtal danger. The disadvantages of this method are the intricacy of technique, the length of time that must be spent at the bedside, the necessity of isolating the patient, and the possibility that proctitis may follow the introduction of ether into the rectum.

SEDATIVE DRUGS

Sedative drugs used in midwifery are bromides, chloral hydrate, morphia, and hyoscine. These secure diminution of the sensation of pain by acting direct upon the brain and are of very great value in the first stage of labour. The use of bromide, either alone or in conjunction with chloral hydrate or chloralamide, is common. Repeated doses of potassium bromide and chloralamide, of each grs. 20, is indicated in the first stage of labour if this is at all prolonged, and in women who are nervous and highly strung; but if the first stage is excessively long these drugs are seldom effective enough to be given alone.

Morphine may be given alone or in conjunction with hyoscine producing twilight sleep in the first stage of labour. When given alone it is of special use in cases of prolonged labour due to mild disproportion which can be overcome by gradual moulding of the fœtal skull, and in cases of primary uterine inertia which is often associated with occipito-posterior presentations. There is no danger in this method of treatment if the cervix is not fully dilated, but the drug in doses of one-sixth to one-quarter of a grain should be given early before the patient is completely exhausted.

Omnopon is reputed to produce a fair degree of analgesia without reducing the force and frequency of the contractions, 1 c.cm. of the solution being equivalent to one-third of a grain of morphine. Besides having central analgesic action, morphine in labour has also the local beneficial action of lessening the contractions in frequency and increasing their duration.

Twilight sleep, consisting of combined morphine and scopolamine (hyoscine hydrobromide) followed by scopolamine alone, has many disadvantages. If an island of memory occurs owing to delay in giving a dose of scopolamine, the patient may subsequently build up the whole course of the labour upon the memory of one or two pains. The method is dangerous to the child if it is begun when the delivery is expected or occurs within three hours. In such a case the baby is born in deep narcosis and efforts at starting respiration may be of no avail. The combination of drugs affects uterine contractions, causing delay in the first and second stages, with an increased incidence of forceps delivery and danger of post-partum hæmorrhage. Some patients, moreover, have an idiosyncrasy for hyoscine and react to its administration by becoming excited and violent. Twilight sleep is, however, ideal for the very nervous primipara, whose fear produces an inertia and irregularity of uterine contractions which delays the birth of the child. Morphia and scopolamine relieves the patient of her apprehension and hypersensibility and the uterus begins to act more normally.

HYPNOTIC DRUGS

These are derivatives of barbitonum and consist of Avertin, Nembutal, Pernocton, and Sodium Amytal. Sodium Soneryl has recently been tried as a premedication before anæsthesia for operation, but as far as I know no report has been published on its effect when given during labour. All these derivatives of barbitonum have been acclaimed by individual workers as producing a sufficient degree of hypnosis during labour to render the patient forgetful of the pains when she recovers full consciousness.

Avertin in a group of cases at this hospital has given very satisfactory results if injected at the right time and stage. We have given doses of 0·08 g. per kilogramme of body-weight less 14 lb. as the estimated weight of fœtus and placenta, but I think it would be safe to give 0·1 g. per kilogramme after allowing for the weight of the child. The avertin is injected when the cervix is two-thirds dilated in primiparæ and half dilated in multiparæ. The great disadvantage in this method of producing hypnosis during labour is that, if the avertin is given rather later than usual, the rectum either will not hold the injection or the avertin will be returned before it is absorbed as the fœtal head is driven down against the rectal wall during a contraction. The method is good in cases admitted to a hospital or nursing-home before they go into labour. In all our cases considerable relief from pain was experienced and many patients could remember nothing of the labour after the injection of avertin. In some cases the labour is prolonged and there is a slightly increased incidence of forceps delivery. In our cases the third stage of labour was normal and there were no instances of post-partum hæmorrhage, and no case in which the injection produced excitement and violent movements; but such a complication is known to have occurred and it is necessary therefore to have a competent nurse always in attendance. The avertin must be freshly prepared.

Nembutal is probably the safest and easiest of the barbitonum derivatives for use in labour. It is given by mouth in gelatin capsules because the drug decomposes in air, each ampoule containing grs. 1½. There are various ways in which this drug may be administered in labour. Probably the best method is that described by O'Sullivan and Craner in which a combination of nembutal and chloral hydrate is given. It is important to administer the drugs at the right time, as, if given too early, the force and frequency of the pains may be diminished

and, if given too late, the patient will suffer considerably before the effects of the drug treatment are experienced, and remembering this, will feel that she has had little relief.

In their series of cases O'Sullivan and Craner had complete success in 62 per cent., and failure to produce relief in 7 per cent. In the remaining 31 per cent. of cases varying degrees of hypnosis were produced. I have used nembutal in labour in a good many cases, and, on the whole, the results are quite satisfactory. If nembutal and chloral hydrate are used together a trained nurse must be in constant attendance on the patient. It is quite feasible, however, to use nembutal alone late in the first stage of labour and in smaller doses such as grs. 3 only, when the patient gets considerable relief. The disadvantages of this drug in labour lie chiefly in the fact that it is impossible to judge accurately the right dose for each patient. It is possible in rare instances that grs. 3 of nembutal is too much or that when an additional dose of grs. 3 is given the narcosis may become too deep. As yet no antidote is known for use in cases of nembutal overdose. In our series several patients had more than grs. 7½ of nembutal and one of them received grs. 9 without any ill-effects to either mother or child.

Pernocton is another derivative of barbitonum of complicated formula. It may be given intramuscularly or intravenously, but if given subcutaneously there is great danger of producing a large sloughing area. I have not used this drug personally, but I have seen the results of its use when given by the intravenous route, when it does not appear to delay the progress of labour in normal cases, and if the injection is not given too late, there is no increased incidence of asphyxia and oligopnœa in the baby.

Sodium amytal.—I have had no experience with the use of this drug, which is said to produce efficient narcosis in the average case. It has the great disadvantage that it results in violent excitement in quite a large number of patients; some respond to an average dose much better than others, and there is no means of discovering an idiosyncrasy to the drug before its administration.

As sedatives, when given by mouth in the first stage of labour, the barbitonum derivatives, notably *Veramon* (grs. 9) or *Allonal* (two or three tablets) are of special use, especially in cases of severe primary uterine inertia.

CONCLUSION

To summarise the best methods in individual cases: In normal labour not unnecessarily delayed, chloral hydrate and possibly veramon should be used during the first stage. During the late second stage the patient may use the Junker apparatus herself, unless a midwife is present, who is experienced in giving small amounts of chloroform and ether or chloroform on a mask before and while the head is being born.

For a patient who insists on a large degree of analgesia during the latter half of a labour of normal duration nembutal is probably the best drug to use; but if this drug is used in full doses a midwife must be in attendance the whole time, and the doctor must see the patient frequently. The nearest approach to the ideal method of producing anæsthesia during labour is undoubtedly gas-and-oxygen, and its use by an increasing number of practitioners is likely in the future. After a little practice anyone can give gas-and-oxygen well enough to produce great relief in the second stage of labour.

As the public demands with increasing vigour some safe method, it would be the best policy to try to overcome the disadvantages of the method of administering gas-and-oxygen in order to promote its wider use.

In cases of abnormal labour, such as primary uterine inertia and considerable delay in the first stage, &c., I suggest the exhibition of chloral hydrate followed by veramon or allonal followed by omnopon if necessary. In the second stage of labour in such a case care must be taken to avoid the use of anæsthetics too early, unless gas-and-oxygen are used. If forceps delivery is necessary chloroform or a mixture of chloroform and ether is probably the best.

For the very nervous patient twilight sleep is suitable despite its disadvantages.

COMMON FRACTURES OF THE LOWER LIMB

(MR. JOHN P. HOSFORD)

I PROPOSE to discuss the treatment of only three or four of the commoner fractures in the lower limb. First amongst these is

FRACTURE OF THE NECK OF THE FEMUR

This may be either extracapsular or intracapsular (according to the old and best known nomenclature). It is to the treatment of the fracture in old people that I propose mainly to refer, and in them the intracapsular is the commoner.

The diagnosis, with the slight shortening, external rotation, pain, and disability is not usually difficult. The old practice of allowing patients to remain propped up in bed with their leg supported by sandbags under the belief that non-union was almost inevitable cannot be too strongly deprecated. Only in very old persons with weak hearts or other severe infirmity is this advisable. No age-limit can be given, but certainly in patients under 75 it is usually worth while to attempt to correct the displacement and splint the limb until union has occurred. Numerous methods of internal and external fixation have been and are advised, but fixation in abduction (Roy Whitman) in plaster is probably the simplest of the recognised methods. Unless there is some strong contra-indication I always employ this method. The patient, under general anæsthesia (preferably gas-and-oxygen with a very little ether, after a preliminary dose of morphine and hyoscine), is placed on some form of orthopædic table or traction apparatus, and if the characteristic deformity is present strong manual traction is applied to the leg which is then internally rotated and finally fully abducted at the hip. In this position a plaster hip spica which extends to the toes is put on. It is not necessary to include the sound leg provided the plaster is continued high up on the sound side, since by bringing it well up over the lower part of the bony thorax on this side, attempts to adduct the fractured leg are prevented. With the aid of the free sound leg, and a rope and handle over the bed for a hand-grip, patients are not very helpless. I am often surprised how well frail patients tolerate the anæsthetic and the manipulation. A skiagram to check the position of the fragments after the application of the plaster should be taken. The plaster is kept on for three months. The patient then wears a weight-bearing Thomas's calliper splint for a period of some months, the time varying according to the age and weight of the patient and to the position and amount of union of fragments. During this

period the patient may be lifted on to a couch or sit in a large armchair.

FRACTURES OF SHAFT OF TIBIA AND FIBULA

These are common at all ages. In those oblique ones (usually due to indirect violence) in which there is a sharp-pointed end to the proximal fragment, great care has to be taken to prevent its penetrating the skin, if this has not already happened. The treatment of open fractures is so important that I will emphasise the main points. An open fracture is a real emergency; every hour makes a difference. After cleaning and sterilising the surrounding skin (rubbing should not be too vigorous) the wound is excised by cutting through healthy skin immediately around it; any dirt is removed, and lacerated or contaminated tissues beneath the skin are cut out. If this is done within six hours of the accident the skin should be sutured to obtain primary union; if later than this a delayed primary suture should be carried out. For purposes of treatment these fractures may be divided according to whether or not shortening is liable to occur. If no shortening need be feared and the bone ends are well together, the limb should be immobilised in a plaster cast which should extend from the toes to above the knee; if there is any angular deformity it should be corrected by a simple straightening manipulation before the plaster is applied. In those cases in which there is shortening with overlapping or comminution of fragments I use continuous traction. Skeletal traction is preferable, a Kirschner wire or a pin being put through the os calcis under local anæsthesia; it is far better to put the pin or wire through than just above the os calcis. The limb should be somewhat elevated with the knee a little flexed. After a trial of many splints I have come to like Böhler's leg splint more than any other. With a suitable weight applied to the os calcis and the leg comfortably adjusted on this splint a satisfactory position is usually obtained. A comfortable position usually means a satisfactory one. The limb need not and should not be encumbered with numerous bandages. When early callus is forming and the bones have become sticky—in about three weeks—the leg is removed from this splint and put in plaster from the toes to above the knee. The patient should not be allowed to remain in bed for a long time; it is extremely important for him to be up and about as early as possible either on crutches or better still on some form of ambulatory splint. A long period in bed causes rarefaction of bone, wasting of muscles, a disorganisation of the vasomotor tone of the limb, and mental depression. Delayed union is common in fractures in the lower half of the tibia, but this should not tempt the surgeon to do an open operation and insert any form of hardware.

FRACTURES AT THE ANKLE-JOINT

The commonest of these is an isolated oblique fracture of the lower end of the fibula without displacement and without injury to ligaments. Liability to displacement is slight, and after treatment with a firm bandage applied over wool for a few days to reduce swelling the ankle should be strapped very securely and the patient encouraged to walk naturally but moderately. A Pott's fracture, a name which should only be used for a fracture-dislocation of the ankle-joint in which the foot is everted and displaced outwards and perhaps backwards, is also unfortunately common. In those cases where there is backward displacement the posterior margin of the articular surface of the tibia is also broken off in addition to the fracture of the lower end of the fibula and the internal malleolus. Malunion of a Pott's fracture is not infrequently seen; to obtain a good result is not difficult, but the greatest care and attention to detail in the splinting of the fracture is necessary. Undoubtedly the best time for reduction of the fracture is as soon after it has occurred as possible. The knee must be flexed, and while steadying the lower end of the calf with one hand, the foot is drawn forwards and inwards with the other; this must be done firmly to ensure full reduction; over-reduction is extremely unlikely to occur. The limb is now encased in a close-fitting, evenly moulded, unpadded plaster-of-Paris cast, which is put on rapidly, and before it has begun to set the same grip is assumed as when reducing the fracture, and is maintained, being sure that the reduction is complete, until the plaster has set. The foot should not be strongly inverted, but the plaster should be well moulded to support the arches of the foot. It is my practice to split the plaster anteriorly in its whole length but not to remove it, and to elevate the limb to about 45°. If this is done there is little fear of serious pressure from the plaster. In a week to ten days, when the swelling has subsided, this plaster is replaced by a similar one which is not cut down anteriorly; an iron walking heel is then fixed to the plaster cast and the patient encouraged to walk about. After about six to eight weeks the plaster is removed, and an Elastoplast bandage is applied to well above the ankle to prevent swelling. The patient is then encouraged to walk normally, in a boot which has the inner border of the sole and heel wedged.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 17TH, 1933

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 18 (last week 18); scarlet fever, 1771; diphtheria, 686; enteric fever, 29; acute pneumonia (primary or influenzal), 840; puerperal fever, 33; puerperal pyrexia, 92; cerebro-spinal fever, 23; acute polio-myelitis, 11; acute polio-encephalitis, 3; encephalitis lethargica, 10; dysentery, 7; ophthalmia neonatorum, 77. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 20th–21st was as follows: Small-pox, 49 under treatment, 1 under observation (last week 54 and 0 respectively); scarlet fever, 1656; diphtheria, 1620; enteric fever, 11; measles, 472; whooping-cough, 356; puerperal fever, 21 (plus 4 babies); encephalitis lethargica, 233; poliomyelitis, 0; "other diseases," 220. At St. Margaret's Hospital there were 19 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In 118 great towns, including London there was no death from small-pox or enteric fever, 26 (1) from measles, 6 (1) from scarlet fever, 11 (2) from whooping-cough, 29 (3) from diphtheria, 41 (9) from diarrhœa and enteritis under two years, and 15 (1) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 11 fatal cases of measles and Rhondda 3. Four of the deaths from diphtheria were also in Liverpool. Diarrhœa and enteritis caused 4 deaths in Manchester and 3 each in Liverpool, Birmingham, and Stoke-on-Trent.

The number of stillbirths notified during the week was 292 (corresponding to a rate of 40 per 1000 total births), including 41 in London.

SPECIAL ARTICLES

THE CONGRESS OF MILITARY MEDICINE

MADRID, MAY 29th–JUNE 4th

(FROM A CORRESPONDENT)

ONE of the principal subjects discussed at the seventh International Congress of Military Medicine and Pharmacy at Madrid was Preventive Inoculation on which papers were read by Colonel W. P. MacArthur (Great Britain) and Major Masaji Kitano (Japan).

INOCULATION AGAINST DISEASE

Major KITANO said that almost every soldier in the Japanese Army now receives antityphoid inoculation. He demonstrated the accompanying Chart showing the incidence and mortality from 1887 to 1931 in the Japanese army and amongst the civil population in Japan proper during the same period. Inoculation was begun in the autumn of 1908 and was gradually made compulsory, being carried out generally once a year. In 1910 barely half the total strength were protected, but in 1911 nearly 100 per cent. The decrease in the number of cases of typhoid fever corresponded with the extension of preventive inoculation, and this fact could not be explained by a natural decrease of infection or by general hygienic and prophylactic measures. In the civil population at this time there appeared to be a slight increase both in incidence and mortality. Although general prophylactic measures were being gradually improved about 1910, no single measure to cause such a rapid decrease in the number of cases of typhoid fever was introduced into the army at that time. The decrease could therefore, in Major Kitano's opinion, be explained only by the effects of preventive inoculation. For protection against bacillary dysentery, he said, extensive use has been made in Japan of a solid vaccine in the form of tablets, with successful results. The largest number of cases of dysentery ever recorded in the Japanese army was in 1899 when there were 7·7 cases and 1·24 deaths per 1000 of strength. There was a gradual decrease until 1910 when the figures were 0·4 cases and 0·07 deaths per 1000. In 1917 a marked tendency to increase was noted and in 1929 there were 6·1 cases and 0·6 deaths per 1000. At that time there were four times as many cases of dysentery as of typhoid fever and in 1931 sixteen times as many, although there were no deaths therefrom. At first a liquid vaccine was used, but latterly the solid vaccine had been used with very satisfactory results. Two kinds of tablets were used: Tablet A against the Shiga type of bacillus (each tablet contains 6 mg. of dried Shiga type of bacilli); Tablet B against Y and F types of bacilli. In preparation of the tablets, sterilisation by formalin was used for the Shiga bacilli so as to prevent detoxication and decomposition prior to drying. For Y and F type bacilli heat sterilisation at a temperature of 56° C. was employed. The tablets were coated with salol to prevent digestion in the stomach. The following was the composition of the tablet: dried bacteria, 0·017; powdered sugar, 0·12; milk sugar, 0·12; starch, 0·037; talc, 0·006. Tablet A was administered with a glass of warm water in the early morning on an empty stomach on five successive days. Tablet B was given in the same way on the succeeding five days. When the type of dysentery was definitely known only the appropriate tablet was given.

In the years 1930 and 1931, among 14,184 men who had partaken of the tablets there were 88 cases of dysentery, or 6·2 per 1000; of 14,327 men not so protected there were 137 cases, or 9·51 per 1000. Monthly comparisons showed that except during the month in which administration of the tablets was begun fewer cases occurred amongst those protected. It had been shown that the degree of protection was about equal with the liquid vaccine and with the tablet form. With the liquid vaccine the general reaction was less, and the local reaction greater than with T.A.B. inoculation. With tablet vaccine the reaction after oral administration was very slight and

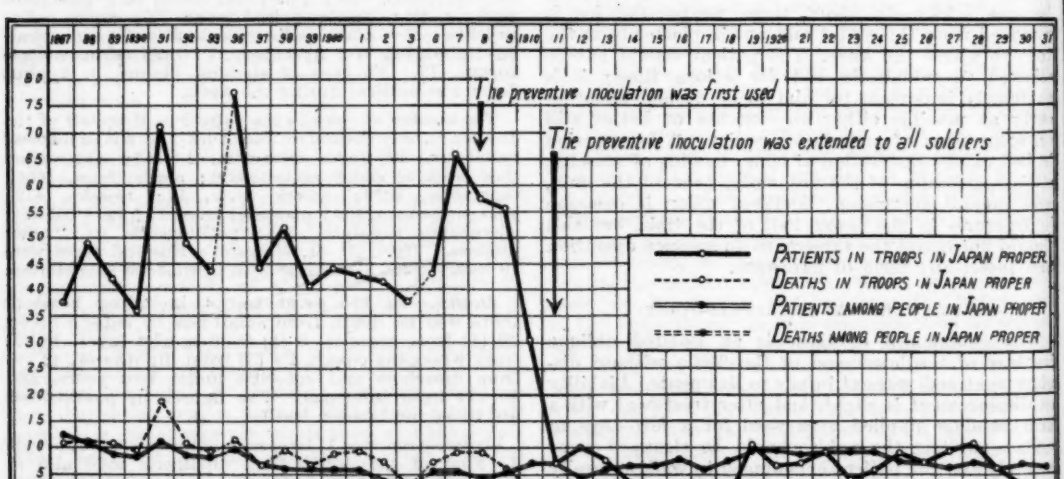


Chart showing morbidity and mortality from typhoid fever per 10,000 in the Japanese army and in the general population of Japan proper from 1887 to 1931.

it was seldom necessary for the soldier concerned to be struck off duty. After oral administration headache was the chief complaint in the case of tablet B and next in order of frequency came gastric disturbance, diarrhœa, anorexia; with tablet A, diarrhœa was most frequent and next in order came gastric disturbance, feeling of tiredness, abdominal discomfort, headache.

General DOPTER (France) said that a law had been passed in France making immunisation against diphtheria compulsory in the French army when the competent local authority considered such action necessary. He also said that diphtheria immunisation was now carried out simultaneously with T.A.B. inoculation when possible. This reduced the number of inoculations and the period of inefficiency.

OTHER SUBJECTS DISCUSSED

A resolution was passed stating that the congress "having considered the constantly increasing dangers of bombardment to which medical units and fixed hospital establishments are likely to be exposed" makes the following recommendations:—

(1) That hospital areas be reserved for the exclusive requirements of the medical service and placed under the sign of the Red Cross.

(2) That regulations be introduced as early as possible to determine the conditions of application of this recommendation in the Geneva Convention for the amelioration of the lot of the sick and wounded in the armies in the field.

Meetings were also devoted to the treatment of the more urgent surgical cases in the front area during war of movement; consideration of a specialised unit, its organisation and tactical employment; the preserved foods forming part of the rations issued in the Services in peace and war; and a comparative study of the organisation of the different military services as regards dental and administrative services.

DEMONSTRATIONS

During the course of the Congress surgical operations were carried out by several visiting foreign surgeons at the large Military Hospital of Carabanchel (3000 beds). This hospital was recently completed and is a fine modern institution. One special feature is the provision of accommodation for the members of the families of officers who are under treatment in the hospital.

An exhibition of medical and surgical equipment was held in the grounds of the Retiro Park. This included a demonstration of a fully equipped army hospital with operating theatres, X ray equipment, and other special services. In addition a field hospital organised by the Spanish Red Cross Society was on view. This was fully equipped and staffed and gave the impression of being a thoroughly serviceable unit. In the exhibition proper there was a display of the first field dressings of various countries and of the field operating equipment used in the Spanish Army. This was contained in stainless steel cases, the instruments being arranged in trays superimposed one on another. In a display of radiological equipment, a full size X ray photograph of the human skeleton was shown.

The opening meeting was presided over by the President of the Republic, who later held a reception at the National Palace. The next congress will be held in Bucharest in 1935.

CORNELIA AND EAST DORSET HOSPITAL.—This hospital at Poole, which has been rebuilt and extended three times in the present century, has now been further enlarged. The additions, which include a theatre on the most modern lines and cost £7000, were opened last week by Lord Dawson.

MEDICINE AND THE LAW

Doctors in Slander Action

AT the Chester assizes last week the plaintiff and defendant were medical practitioners living in the same town in North Wales, the defendant being the medical officer of health. The plaintiff claimed damages for slander on the following grounds. A woman who was his panel patient had, it was said, applied to the local authority for more suitable accommodation. She was referred to the defendant as medical officer who asked, "who is your doctor?" When she named the plaintiff the defendant was said to have said, "You know I take panel patients as well." On another occasion the defendant was said to have remarked to her of the plaintiff, "Oh! he is no good; why don't you change for me?" Defendant, it was alleged, had also shown her a number of envelopes containing panel patients' cards and had added, "They are all changing from him to me; why don't you do so?" The defendant doctor denied the allegations and said he had always been on friendly terms with the plaintiff. The jury evidently disbelieved the denial. They found a verdict for £50 damages for the plaintiff, for whom judgment was given with costs.

There are few graver breaches of professional propriety than the disparagement of a brother practitioner and the poaching of his patients. While the medical profession invariably suffers when one member of it sues another, it is hard to see what other course the plaintiff could have taken in the face of the facts which the case must be taken to have established.

Ambulances and Red Tape

In view of the evidence at a recent inquest, some coördination of the ambulance services of adjoining local authorities seems called for. A car was overturned on the Kingston by-pass road and the driver was fatally injured. The scene was 70 yards from the stream which forms the boundary between the urban district of Surbiton and that of Malden and Coombe. Four minutes after the accident the Surbiton council's ambulance appeared. Its driver, observing that the injured man lay on the wrong side of the boundary, halted at the stream, reversed his vehicle and drove away. Apparently he had strict orders, very definitely framed a few years ago, not to cross the boundary into an adjoining district. Some 20 minutes later the Malden and Coombe ambulance arrived and thus, after a delay which would often have serious results, the patient was removed to hospital. At the inquest an official of the Malden and Coombe council said that coöperation with Surbiton in this matter had been attempted some years ago but had broken down for want of agreement as to the payment of charges. Malden ambulances, he said, had gone into the Surbiton area at least six times in the past 12 months. The clerk to the Surbiton council said there were two sides to the question; on one occasion a Surbiton ambulance had gone into another district and had afterwards been asked by the local authority concerned (not Malden and Coombe) to keep away in future. The coroner rightly observed that human life was the first consideration.

Doubtless the authorities concerned will make joint arrangements to prevent the repetition of such incidents without further delay. It is no time to stand upon geographical dignity when a man lies dying. If adjoining councils cannot agree, there

will be a strong case for organising ambulance services by larger units. The present system of summoning help on the fringe of the metropolis seems to demand more knowledge than many people possess. The London Telephone Directory, instructing us how to contend with emergencies of fire, crime, or accident, bids us ask the Exchange for "Fire Brigade," "Police," or "Ambulance" as the case may be, "specifying, if known, the appropriate fire brigade or police station or ambulance authority." How many travellers on the Kingston by-pass could specify the correct ambulance authority with confidence? Few of us, at any rate, would be other than dissatisfied if the fire-engine or the policeman, summoned in emergency, passed by on the other side out of excessive respect for boundaries and jurisdictions. The good Samaritans of the ambulance service must not be Pharisees.

A Technically Pauper Patient

The Bow county court judge gave judgment last week in a curious case where the Essex County Council was suing a former patient of the Whipps Cross Hospital. To his surprise the patient found himself classed as a pauper (or, as we must nowadays say, a rate-aided person) *malgré lui*. He had been knocked down in a London street by a tram last year and had been taken to the Whipps Cross Hospital with a broken leg and detained for eight weeks. At his admission the hospital authorities went through his pockets and found £7 in notes and 8*s*. in silver which they retained. When he was discharged he asked for his money but was told that it had been applied towards his maintenance. A fortnight later he received a bill for £25 4*s*. 8*d*. for the balance of the cost of his maintenance in the hospital. This he refused to pay. He sued the Essex County Council for the money which had been taken from his pockets. The defendant council told him that having been treated in a poor-law hospital he was technically a pauper and must hand over the property found upon him. He answered that he was not an able-bodied pauper but a certificated public accountant with a broken leg, who had never applied for relief by way of public assistance. The solicitor to the West Ham Corporation explained to the court that the Local Government Act of 1929 had abolished boards of guardians and that the Whipps Cross Hospital had been transferred to West Ham. It was intended to appropriate the hospital as a Public Health Act institution, but the building had not been so appropriated. It therefore remained a workhouse infirmary, and anybody who crossed its threshold automatically became a pauper by virtue of his admission as a patient. Consequently the authorities were right to take away his money. This argument the judge found himself obliged to uphold. It was, he said, unfortunate for the plaintiff that the place to which he was taken in emergency for treatment was a poor-law institution and not a general hospital.

The Local Government Act has created an impression that all pauperdom has been removed and that all public hospitals have now pooled their resources. The case may help to stir the public conscience in the matter of the liability to pay for hospital treatment for traffic casualties. There is an idea that the services of hospitals (and of the doctors and surgeons who administer treatment in this connexion) are a fairy gift miraculously available at no cost to the patient. This obscures the sense of obligation to pay on the part of those patients who can afford to do so.

IRELAND

(FROM OUR OWN CORRESPONDENT)

NATIONAL HEALTH INSURANCE

INTERESTING evidence was given recently before a Select Committee of the Senate in reference to the National Health Insurance Bill now before that body. Sir Joseph Glynn, for many years chairman of the National Health Insurance Commission, pointed out that there was no medical benefit in the Irish Free State, and said that the absence of medical benefit tended to vitiate the system of certification of incapacity. He said also that the whole question of unemployment went with sickness. As unemployment increased, sickness increased. It was the same in all countries. Mr. L. J. Duffy, chairman of the Association of Trade Union Approved Societies, welcomed the abolition of the voluntary societies. He believed that the increase in sickness benefits was in part due to irresponsible certification. Mr. M. P. O'Donnell and Mr. T. Hutchinson, on behalf of the Approved Societies' Association of Ireland, also criticised the system of medical certification. Dr. R. J. Rowlette, President of the Irish Medical Association, said that national health insurance should be something more than mere payment when a person was sick. It should attempt to improve the health of the country as a whole, and particularly of a class which came under the insurance. It should be coördinated with the public health system of the country. The present Bill would create an extremely powerful body whose duty would be only to carry out one part of the health work of the country without being in contact at all with the other health activities. The societies had never concerned themselves very much with the health of their members, and contented themselves with the provisions of benefit. In answer to questions he said that if there was going to be unification there should be a nationalised State system of insurance. The provision of medical benefit was an essential part of any scheme of national health insurance. As regards certification, he did not question that evidence of laxity and remissness in their issue could be got. It was not, however, representative of the present system as a whole. Mr. S. T. O'Kelly, Minister for Local Government and Public Health, said that they were attempting to deal with a crisis that was threatening in national health insurance. When he came into office as Minister he was advised by the officials of his Department that a Bill of this sort was urgent. The danger was that if they did not tackle the problem in this way there might be reduced benefits. They thought it would be more equitable to bring all the insured persons into one society, sharing credits and losses all over. Senator Dowdall said there was a consensus of opinion that unemployment caused the greater drain on benefits. It had been suggested that this was due to lax certification. He himself thought that a medical officer was entitled to give a certificate on borderline cases. The Minister said that was a matter that rested with the conscience of the doctor, and he believed that the mass of medical men were humanitarian. Personally, his inclination would be to act generously, but as Minister he would be bound by the law. He mentioned a case where he had heard that a doctor had signed a book of certificates, and left it on his hall table, so that certificates could be given to people calling.

HONORARY DEGREES AT THE NATIONAL UNIVERSITY

The Senate of the National University of Ireland has decided to confer honorary degrees on the following on the occasion of the visit of the British Medical Association to Dublin:—*D.Sc.:* Prof. Joseph Barcroft, Dr. Rufus Cole, Prof. Dean Lewis, Prof. T. H. Milroy, and Sir Edward Sharpey-Schafer. *D.Sc.* (Public Health): Prof. J. M. Beattie, Sir Leslie Mackenzie, and Sir John Moore; *M.D.:* Sir Robert Bolam and Sir Henry Brackenbury. *M.Ch.:* Mr. J. F. O'Malley and Sir Hugh Rigby. *LL.D.:* Prof. T. G. Moorhead and Sir Humphry Rolleston. *D.Litt.:* Dr. T. P. C. Kirkpatrick.

A REPORT ON THE CLINICAL VALUE OF "EVIPAN"

(FROM THE ANÆSTHETICS COMMITTEE, MEDICAL RESEARCH COUNCIL)

ENCOURAGING accounts of the action of a barbiturate anæsthetic, "evipan," which came from German surgeons and anæsthetists seemed to the Anæsthetics Committee to warrant a thorough clinical trial. Twenty-five thousand cases are reported from that country, with one death attributed to "evipan." Accordingly, the offer of Bayer Products, Ltd., was accepted and supplies of the new drug were put at the disposal of the Committee. In making use of these the Committee had the coöperation of a number of anæsthetists and others who have sent details of their cases. At St. Bartholomew's, Messrs. F. T. Evans and Rait-Smith; at Guy's, Mr. R. C. Brock; and at St. George's, Messrs. Douglas Belfrage and E. Landauhave assisted in this way; and Dr. J. M. Barlet, Mr. C. Borland, and Dr. R. Jarman are others who, with Mr. C. Pannett and Sir Francis Shipway, Dr. C. F. Hadfield and Dr. J. Blomfield, members of the Committee, have furnished the material for this report.

Evipan sodium is the sodium salt of N-methyl-C-C-cyclo-hexenyl-methyl barbituric acid, and dissolves freely in water, but the solution is stable only for an hour or two. Thorough pharmacological work carried out in Germany showed the drug to have a high therapeutic quotient in cats and dogs. In the former 25 mg. gave full anæsthesia, while the lethal dose was from 100 to 110 mg., a quotient of 4, and in dogs the quotient was 3·3. Parsons found that in the cat 0·1 c.cm. of a 10 per cent. solution caused a fall in B.P. of 25 mm. Hg, with slow recovery and apnœa for 20 seconds. After a total of 0·6 c.cm. of 10 per cent. solution artificial respiration was needed and the B.P. fell until death. The anæsthetic action of the drug was rapid in onset and short in duration. It is not a volatile anæsthetic but it is very rapidly detoxicated by the liver. Rabbits decompose half the narcotic dose within 13 minutes. Traces of the unchanged substance are excreted in the urine. By-effects in animals were found to be slight. The blood pressure fell 15 to 20 mm. Hg. The pulse remained regular and full. Overdose caused cessation of the breathing, the heart continuing its beat for a considerable time after. Blood-sugar was unaltered and other evidence of effect on body metabolism was of the slightest.

TECHNIQUE AND DOSAGE

When used for anæsthesia evipan is given intravenously. At first the drug was issued in ampoules, each of which contained 3·5 c.cm. of 33⅓ per cent. stable solution in methyl-di-glycol; 3 c.cm. of this contained 1 g. of evipan sodium. Ampoules containing 7·5 c.cm. of distilled water, but capable of holding 10 c.cm., were also issued, and before use 3 c.cm. of the concentrated solution were drawn into the syringe and expelled into the ampoule containing the distilled water. The evipan solution was sticky and required therefore a larger needle than the ordinary hypodermic size. Now, however, the evipan is supplied in powder form in ampoules to which the distilled water supplied in another ampoule is added. By aspirating and reinjecting once or twice, a solution is obtained which passes easily through the ordinary hypodermic needle. This is inserted into a suitable vein of the arm with due antiseptic precautions. It is advisable to have the arm held steadily by a second person because of the twitching of muscle, which often comes on early after injection has begun. The solution is run in at the rate of 1 c.cm. in 15 seconds. Dosage is determined by the characteristics of the patient and the results noticed. Acting on a definite scale arranged according to body-weight does not give satisfactory results. An average amount to produce unconsciousness is about 3 c.cm. A good plan, recommended by Lauber of Könisberg who has had a big experience, is to make the patient count. When the counting ceases through sleep the amount that has been injected is noted, and the same amount is further added for a short operation and twice as much for a long one. In elderly and feeble people and those who have gone to sleep exceptionally quickly, only half the amount which produced sleep is added. Most patients are asleep in about one minute. There is often some twitching or jactitation, but often complete relaxation of the muscles of tongue and jaw occurs early and care is needed to preserve a patent airway. Generally speaking 10 c.cm. are regarded as the maximum dose. When it is desired to complete a longish operation under evipan only, the needle must be left in situ and a further injection made when the anæsthetic effect of the first is obviously wearing off. Used in this way, as much as 20 c.cm. have been injected. There is, however, a fluctuation in the anæsthesia, and we do not see evidence of any advantage in the use of evipan for other than short operations—i.e., of 20 minutes or so at the outside.

SYMPTOMS PRODUCED

A deep yawn just before the disappearance of consciousness is a common symptom. The great majority of patients fall asleep perfectly quietly. Twitching of face muscles is common and there is sometimes jactitation of limbs. In one instance tonic contraction of many muscles and brief stoppage of respiratory movements were observed. The degree of muscular relaxation varies but is rarely extreme or sufficient for an abdominal operation. The pupil is usually moderately dilated but active to light. In the early stages it is sometimes widely dilated. The conjunctival and generally the corneal reflexes have disappeared at the moment of fullest effect. Even then reflex movement at the start of operation has been seen many times. The eyelids are sometimes widely separated.

The effects on blood pressure are slight. There is commonly a fall of about 20 to 30 mm. Hg which is quickly recovered from. Respiration is often somewhat slowed, but there has been seen no serious depression except in one instance when unknown to the anæsthetist the patient, an elderly woman, had received a full dose of morphia and hyoscine before the evipan. The combined result was respiratory

stoppage requiring, and removed by, artificial respiration and CO_2 with oxygen. It is inadvisable to give any sedative before evipan. No special preparation is needed, but it is of course desirable to have the stomach empty. Subjective symptoms as described by reliable patients are a feeling of quickly increasing lassitude which cannot be overcome, and loss of consciousness in a few seconds. Experience shows nevertheless that it is as a rule best to wait two minutes after completing the injection before beginning to operate. The length of time of unconsciousness is usually about 10 to 20 minutes after an average dose. After this time the patient can talk, but is sleepy and will drop off again if left quiet. When he finally wakes he remembers nothing after the first prick of the needle.

As in the case of other anæsthetics there is considerable difference in the reaction of different persons to evipan, and the exact behaviour cannot be foretold. The patient may go to sleep with no apparent difficulty and the usual signs of anæsthesia be present, and yet there may be movement on incision to an extent demanding a supplementary anæsthetic. On the other hand, it often happens that merely 3 c.cm. give a perfectly satisfactory, though of course only a short, anæsthesia.

Our experience does not corroborate the statement of Ernst that one can reckon almost always on half an hour's good anæsthesia. We are led to believe that in Germany the surgeon is satisfied with a narcosis which is not regarded as enough by most operators in this country. Certainly the German reports describe a more constant and sufficient anæsthesia than has been obtained here by the same dosage and technique.

CONCLUSIONS

It is obvious from what has been stated that evipan is not to be regarded as a basal narcotic in the sense that, for example, nembutal and avertin are. Its action is so evanescent that it cannot be employed as are these drugs for procuring a longish period of quiet or of unconsciousness before the administration of the anæsthetic proper, nor can it be used, as are these basal narcotics, to put the patient to sleep in his bed in order to avoid all knowledge of transference to the operating theatre. If it is used before another anæsthetic this must follow closely on the administration of the evipan, and as a preliminary therefore it is to be classed with nitrous oxide and ethyl chloride rather than with the basal narcotics. For those who like intravenous methods it is certainly an admirable means of inducing anæsthesia, all opinion agreeing as to the rapidity and pleasantness with which the patient becomes unconscious. Excitement or restlessness during induction have been seen only in unusually emotional subjects. After-effects also are of rare occurrence. It can be relied on for an excellent anæsthesia in minor surgery, that is, for short operations when the possibility of slight reflex movement is not a matter of great concern. It is true that often the anæsthesia is profound and that by repeating the injection it can be prolonged, but it is not obvious that this is a better procedure than usual methods, such as gas-and-oxygen for example. The recovery free from after-effects and the quiet induction make evipan a valuable agent in the case of persons gravely ill, for whom a short anæsthesia is desired for any reason. There are many such instances when it would probably be preferable even to nitrous oxide.

Two examples of this kind may be quoted from our series. A man, aged 62, suffering from aortic regurgitation and arterio-sclerosis had amputation of the great toe for gangrene. He received 6 c.cm. evipan. Sleep was induced in half a minute. The operation took 10 minutes, during which time the anæsthesia was all that could be required. After 20 minutes he woke up yawning and was talking a minute later. Half an hour later he fell asleep and slept for six hours. The other example was a man of 36 years, extremely ill with empyema after pneumonia. He was regarded as unfit for a general anæsthetic. Nevertheless, it was decided to use evipan, of which 10 c.cm. were injected. Anæsthesia was good and the operation, rib-resection, was completed without anxiety. The patient was fully awake after three-quarters of an hour and suffered no after-effects. A few trials have been made of the efficacy of evipan by the mouth. It is described as proving less efficient, thus given, than nembutal in the same circumstances. Nevertheless, two or three of the tablets in which it is provided for oral administration are a useful hypnotic, generally causing sleep in a short space of time. It is a useful agent with which to break a habit of sleeplessness.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

THE following appointments have been notified: Surg. Comdrs. C. G. Sprague to *President* for R.N. Recruiting Headquarters; and J. Wylie to *Norfolk*, and as Fleet Medical Officer.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Comdrs. A. G. L. Reade to *Renown*; and T. W. Drummond to *Effingham*.

Surg. Lt.-Comdr. D. A. Imrie to *Valiant*.

Surg. Lts. D. R. Goodfellow to *Rodney*; and W. T. R. Chapman to *Malaya*.

ARMY RESERVE OF OFFICERS

Maj.-Gen. C. W. Mainprise, late R.A.M.C., having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY

Lt.-Col. C. H. Budd, from Cambridge Univ. Contgt. (Med. Unit), Sen. Div., O.T.C., to be Lt.-Col.

Lt.-Col. H. Forrest resigns his commn. and retains his rank, with permission to wear the prescribed uniform.

Capt. R. J. Bruce to be Maj.

Lts. G. McLoughlin and H. W. Davies to be Capts.

J. G. Lawson, late Cadet C.S.M., Durham Univ. Contgt. (Med. Unit), Sen. Div., O.T.C., to be Lt.

Lt. J. E. Foran resigns his commn.

R. Evans to be Lt.

Supernumerary for service with O.T.C.: 2nd Lt. R. H. Foster, from Gen. List, to be Lt. supern. for serv. with Univ. of Lond. Contgt. (Med. Unit), Sen. Div., O.T.C.

G. A. Kane (late Lt., R.A.M.C.) to be Lt. supern., for service with Queen's Univ. Belfast Contgt., Sen. Div., O.T.C.

INDIAN MEDICAL SERVICE

Lt. D. McCarthy to be Capt. (prov.).

ROYAL AIR FORCE

The undermentioned are granted short service commissions as Flying Officers for three years on the active list: J. S. Carslaw and T. C. Macdonald.

ENLARGEMENT OF CROYDON MENTAL HOSPITAL.—The mayor of Croydon, Alderman W. Peet, recently opened four new villa blocks at the Croydon Mental Hospital at Chelsham. The new buildings, which have cost £51,000, comprise four detached buildings, two for each sex, holding 50 patients each. Apart from cooking, which is done at a central kitchen, each villa is a self-contained unit. The total present number of patients is 822. Land has been secured for further additions in the shape of admission units and a convalescent villa.

OBITUARY

FRANK A. G. JEANS, F.R.C.S.

SURGEON, THE ROYAL INFIRMARY, LIVERPOOL

THE news of the sudden death of Mr. Frank Jeans, at the early age of 55, came as a severe blow to his numerous friends. It was known that he had gone to Harrogate for a holiday to recuperate, but none suspected that this journey was to be his last. "It is impossible to realise that his rare spirit has gone, and that a personality so rich is already only a memory," writes the colleague and friend to whom we are indebted for much of the following short memoir.

Frank Alexander Gallon Jeans received his early education at Birkenhead School, and later proceeded to Cambridge, where he took his B.A. degree in 1899, and obtained the diploma of the Conjoint Board in 1904. Later he took the M.B., B.Chir. at Cambridge, and in 1907 the F.R.C.S. of England. After some years of study in London, at King's College and St. Bartholomew's, he returned to Liverpool, where he became house surgeon at the Royal Infirmary. In 1909 he was elected assistant surgeon to the infirmary, and in 1924 he succeeded the late Mr. Thelwall Thomas on the senior staff.

During the war Jeans saw service as surgeon to the Liverpool Merchants' Mobile Hospital, holding the temporary rank of major. On his return from active service he threw himself with enthusiasm into the practice and teaching of surgery, and he rapidly became an outstanding figure in the professional life of Liverpool and the outlying districts in North Wales and South-West Lancashire. His early successes were associated with abdominal surgery, but later the study and practice of urology claimed him, and his election a few years ago as president of the urological section of the Royal Society of Medicine gave him particular pleasure. Among other positions he held that of lecturer in clinical surgery at Liverpool University, and he was vice-president of the Liverpool Medical Institution. His contributions to medical literature were on the purely clinical side; the aloof attitude of the research worker and academic scientist was entirely alien to his nature.

"To draw a satisfying picture of a personality so many-sided as that of Frank Jeans is impossible," writes Dr. Douglas Bigland. "He was a man of many dimensions, and any conventional presentation of his character must seem flat and out of perspective. An impressionist portrait, a mere series of glimpses, can alone be attempted. In such a 'silent picture' the man's wonderful gift of speech is difficult to portray. Undoubtedly Jeans will live in the memories of his friends as one of the most accomplished orators and after-dinner speakers in their experience. Each one must treasure particular examples of his brilliance. For me the recollection of his speech at a school reunion dinner when he proposed the health of the late Lord Birkenhead, another old boy of the school, and engaged in a battle of wits with that not unskilled opponent I still cherish as something which can never be equalled. No function was complete without a speech from Jeans, and he never failed to reach that level of high endeavour which his artistic soul demanded. It would be entirely wrong, however, to think that his wit was the result of careful elaboration. He was the delight of committee meetings and other gatherings where in a few words of flashing humour he would sum up a case and leave nothing more for anybody else to say. In defiance of natural law he made the sun shine on many dreary evenings. His clinical aphorisms, well salted with wit as they always were, tickled the palate and aided the mental digestion of his students in such a way that to forget was impossible. Behind all his wit was a profound clinical acumen which won the admiration and envy of his colleagues. To him surgery was no mere academic study but a living thing.

MR. FRANK JEANS

[Photograph by Burrell and Hardman

"Nobody could know Jeans long without realising that he was at heart an artist. His love for the theatre and everything connected with it was the breath of life to him. Everything he said or did had a dramatic element, an originality, an unexpected turn, which was wholly delightful and refreshing. Even surgery one felt sometimes had become almost a department of dramatic art. His wide tolerance and his understanding of all sorts and conditions of men were remarkable, and it is difficult to imagine any circumstance in which he would not be perfectly at home or any situation of which he would not be master. He never forgot his Scottish descent, and he loved to tilt against the foibles of his countrymen of whom he was so proud. Doubtless it was this inheritance which made the artist also a man of affairs, and gave to his judgment a rare value. Lastly, Jeans was intensely interested in the art of living; particularly in its branches of sympathy, ready understanding, and friendship. He was given many talents and, like the good and faithful servant, he was not content to bury them in the ground; rather he developed them constantly and strenuously to satisfy his strivings towards unattainable perfection, and in the kindly service of his friends and patients. 'His was a vivid and vitalising spirit, warm and genial as a fire on a winter day, fresh as a western breeze in spring.'

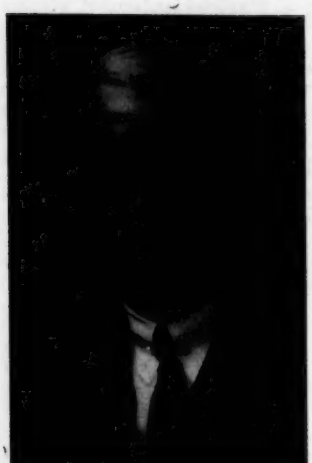
"It is one of the consolations of growing older that as the future gets less and less the past becomes an ever-increasing storehouse of memories of all the wonderful things one has seen and all the wonderful people one has known. In such a storehouse the memory of Frank Jeans will have an abiding place for ever."—A. D. B.

ROBERT HAMILTON RUSSELL, F.R.C.S., F.A.C.S. (Hon.)

WE regret to announce the death of Mr. Robert Hamilton Russell, the well-known Australian surgeon, on April 30th, from injuries sustained in a motor accident.

Robert Hamilton Russell was born at Farningham, Kent, in 1860, and was the son of the late Mr. James Russell, of Farningham. He received his early education at Nassau School, near London, and from

there went to King's College, London. At King's College Hospital he was a student under Lord Lister, and later house surgeon, and in the Mackenzie oration which he delivered at Canberra last year he dwelt with pride on his training under Lister and acknowledged his great debt to him for the inspiration he received in his early years. This, no doubt, was the foundation of the outstanding work Hamilton Russell himself did in Australia. He qualified as M.R.C.S., L.R.C.P. in 1882, served also as house surgeon to Dr. William Playfair, and obtained the diploma six years later of F.R.C.S. For a period of two years he was house surgeon to the Shropshire County Hospital, and before going to Australia he spent a considerable time in hospitals on the Continent, so that he was remarkably well equipped when, in 1889, he went to Melbourne. There he practised until about seven years ago; was surgeon to the Alfred and to the children's hospitals, and was soon recognised as a leading consultant. In 1899 he read a paper at the Inter-Colonial Medical Congress in Brisbane, entitled the Ætiology and Treatment of Inguinal Hernia in the Young which attracted much attention. This paper and later researches into the cause of hernia received widespread notice among surgeons. His views, after a long controversy, were generally accepted, and form the basis of the modern teaching on the ætiology of inguinal hernia. Other writings of the same high standard followed, of which perhaps the most outstanding were on the subjects of urethral stricture and fractures of the femur. He was the first to point out that complete resection of the involved section of the urethra in stricture could be carried out, and that, provided the roof of the urethra was joined, the floor could be left widely open with the certainty of its re-formation. His teachings on the treatment of fractures of the femur are widely known in Australia, and his methods are employed in many children's hospitals there and elsewhere.



MR. HAMILTON RUSSELL

In August, 1914, Hamilton Russell was in England, and was thus engaged in military service at the beginning of the struggle. He went to France with the British Expeditionary Force. He returned to Melbourne with the rank of colonel, and was then attached to the base hospital at St. Kilda and the Caulfield Military Hospital. His surgical skill was steadily exemplified from the beginning until the cessation of hostilities. When the formation of the Royal Australasian College of Surgeons was projected he took an active part in the preliminary procedures, was one of the founders in 1927, and a member of the Council of the College since its inception. At the time of his death he was censor-in-chief to the College, and controlled all admissions to the Fellowship.

Hamilton Russell was a man of singularly attractive disposition and character. The affection in which he was held is shown by the unusual number of tributes that have been made to him during the latter part of his life. In recognition of his work for the Alfred Hospital, the new community block at the hospital has been named the Hamilton Russell House, and a bust of him by Paul Montford stands at the entrance to the hospital. As a tribute to his work for surgery, the Fellows of the Royal Australasian College of Surgeons two years ago presented him with his portrait in oils painted by the late George Lambert, A.R.A. He was at the same time elected an honorary Fellow of the American College of Surgeons. He exercised a remarkable influence on surgical methods in Australia, as well as on the status of the medical profession generally. He is destined to be regarded as one of the foremost pioneers of surgery in the Commonwealth.

CORRESPONDENCE

THE POOR-LAW SICK WARDS

To the Editor of THE LANCET

SIR,—In my article in your issue of May 27th I hazarded the estimate that in 1929 one in ten of the 90,000 poor-law sick beds (England and Wales) were occupied by surgical and acute patients, and the rest by chronics. I indicated that the fraction was greater in the urban than the rural areas. Mr. Eason in your issue of June 17th gives some useful figures indicating, for London only, that the fraction there is much more than one-tenth. On the other hand the Registrar-General's figures show that in London the ratio of deaths in poor-law sick wards to total deaths in the locality is much higher than in the provinces, and these numerous admissions of persons on the point of death must usually be classed as chronics. Acute *v.* chronic is the first outline of classification, but borderline patients who will be classed by different authorities on different sides of the line are quite numerous. But whether the true fraction in any area is one-tenth or three-tenths does not affect my proposition that in most towns and counties it will be more convenient that the management of the chronic sick should be closely associated with the management of the non-sick indoor poor who are very similar people, and that the cleavage in management should come between the chronic and the acute sick. I believe that in France, also, the distinction between the "hospice" for chronic sick and the "hôpital" for the acute is general.

But London is not typical, nor indeed are the largest of the provincial towns, for they have such a number of hospitals. The more normal type is the county town with one voluntary hospital doing the surgical and acute work for both town and county, and one big poor-law sick ward for the town and several small ones for the county, the former doing a small but increasing amount of acute work but the latter doing none. The local councils are now groping about considering with which of two Acts of Parliament they should consider their sick wards to be associated. But these mere legalities fail to allot, and used as titles fail to indicate, any medical aim, and consequently lead only to administrative confusion.

I would protest against Mr. Eason's assertion that the Local Government Act has "separated sickness

from pauperism." I suggest that that statement is merely a playing with words without reference to the ideas which they represent. What our fathers called pauperism has now been relabelled public assistance, and presumably in the future as in the past sickness will be one of the principal reasons why people need to apply for public assistance. Some people think to have reformed the poor-law by giving to outdoor relief the new label of domiciliary relief, it is equally ineffective to relabel the former poor-law sick wards as public health hospitals while keeping the same doctors, the same nurses, the same diseases, and the same buildings.

I am, Sir, yours faithfully,

Cambridge, June 25th, 1933. W. D. BUSHELL.

A FOREIGN BODY IN THE HAND

To the Editor of THE LANCET

SIR,—A woman, aged 67, was recently admitted to the out-patient department of St. Mary's Hospital with an injury to the right hand. A radiographic examination, besides showing an oblique fracture of the fifth metacarpal, also demonstrated the presence of a portion of needle 1 inch long, lying in the depths of the fourth intermetacarpal space. On being questioned concerning this foreign body the patient remembered well having run a needle into her hand, and as there had been at the time some discussion as to whether it should be removed or not, she was able to fix the date exactly—viz., 1883—50 years ago. During the whole of that period she had had no single symptom referable to the presence of the needle in her hand.

The moral to be drawn from this case seems to be the avoidance of the many useless and often mutilating operations performed (especially on the hands and feet) in the search for foreign bodies which, in most cases, can be safely left to look after themselves. Unless a foreign body is either so accessible as to be removed with ease, or so placed that it gives obvious symptoms, a search for it would seem to be both unwise from the surgeon's point of view, and unnecessary from the patient's.

I should like to thank Mr. C. W. Gordon Bryan, on whose behalf I saw this case, for permission to publish this note.—I am, Sir, yours faithfully,

ARTHUR E. PORRITT,
Surgical Registrar.

St. Mary's Hospital, W.2, June 26th, 1933.

SWIMMING BATH DANGERS

To the Editor of THE LANCET

SIR,—The leading article in your issue of June 17th concerning the observations and recommendations of the American workers, Mallmann and Cary, with regard to the bacteriological examination of swimming bath waters, includes the following statement:—

"The contention of the authors, that the routine methods of examination of swimming-pool water treated with chlorine, chloramine, or any similar bactericidal substance may give an entirely false sense of security, would seem to be clearly established; and their recommendation that the source of error they have indicated should be removed by neutralising the free chlorine with sodium thiosulphate when the sample is collected—since routine testing at the bath side is obviously impossible—merits serious consideration."

We entirely agree with this, but would point out that this source of error has for years been recognised and eliminated in the above-mentioned manner by ourselves and other bacteriologists engaged in British waterworks practice, and reference is made to this matter in the fourth edition of the "Examination of Waters and Water Supplies" (p. 691). Since so many drinking-water supplies are to-day treated by chlorination or its modifications, it is equally important to observe the same precautions in these cases also.—We are, Sir, yours faithfully,

JOHN F. BEALE,
E. V. SUCKLING.

The Counties Public Health Laboratories, Queen Victoria-street, London, E.C., June 22nd, 1933.

INTESTINAL TUBERCULOSIS

To the Editor of THE LANCET

SIR,—I hope that Dr. McLaughlin's interesting paper in your issue of June 24th will stimulate further inquiry into the early diagnosis and treatment of intestinal tuberculosis. X ray examination after a barium meal has certainly facilitated the diagnosis, but physical signs and symptoms are, in my opinion, of still greater importance. Fishberg ("Pulmonary Tuberculosis," p. 158) goes so far as to say that with autopsy control X rays only give a correct diagnosis in 50 per cent of cases, whereas with clinical observation 75 per cent is the figure reached. I can fully endorse Dr. McLaughlin's statement that when taken early and properly treated, intestinal tuberculosis has a moderately good prognosis. I have so far been disappointed with cod-liver oil and tomato juice, possibly because the patients treated were already on a diet unusually rich in fresh vegetable produce and animal fat. Light treatment I have found useful in raising the general health in a considerable proportion of cases, but in others minimal doses cannot be exceeded without the production of unfavourable symptoms and the treatment is best abandoned. Light is much more useful in peritoneal than in intestinal tuberculosis. As regards other remedies, I think the main point to have constantly in one's mind is that a tuberculous intestine, like any other organ affected by the disease, requires rest. Foods containing much fibrous residue should be avoided as liable to irritate the wall of the bowel; similarly if milk, peas, or beans cause flatulent distension they must be excluded. Intravenous injections of calcium chloride, which must be given for a period of many months, I have found of great value; I believe they act by reducing the irritability of the smooth muscle of the intestinal wall, and thus providing rest to the affected part. Most important of all, so long as active symptoms are present and for some time afterwards, the patient should be rested strictly. Infection of the bowel by swallowed sputum and continued irritation by the same means may often be prevented by the timely use of artificial pneumothorax, especially when a cavity is present.—I am, Sir, yours faithfully,

ANDREW MORLAND.

The Mundesley Sanatorium, Norfolk, June 27th, 1933.

PERSONS AND SITUATIONS

To the Editor of THE LANCET

SIR,—When reading an examination paper lately I came across the following sentence: "Sulphonal is very useful in cases of insomnia in which *the case* (my italics) after sleeping soundly until about 4 A.M., &c." This strikes me as a choice example of that tendency to confuse "case" and "patient" which is becoming so frequent in medical writings, and I think you would be doing a service by using your influence to check it.—I am, Sir, yours faithfully,

Devonshire-place, W., June 24th. ROBT. HUTCHISON.

*** It is not only flurried examinees who thus misuse English; the error is corrected weekly in important contributions to our columns, and sometimes wins its way into print by persistence.—ED. L

Perspective drawing of the new buildings viewed from Montague Place, looking northwards along Malet Street

LONDON'S UNIVERSITY

"A NOBLE ENTERPRISE"

IF, as has been aptly said, the design of London's university resembles that of a battleship, the foundation of its embodiment in stone by His Majesty the King on June 26th was as inspiring a ceremony as the launching of a big ship. It provided occasion for a display of robes and hoods at least as rich in texture and colour as the flags of the many nations whose learned bodies sent delegates; and the order of proceedings was so planned that while decorum was in nowise sacrificed, the decorative value of academic panoply was exploited to provide a pageant that will not soon be forgotten by those privileged to witness it. Stands, erected on silvered metal, provided seats for 3000 persons on a plot of ground just opposite the ceremonial dais. These stands seemed nearly full an hour before the King and Queen were expected; but when the procession of professors and readers in the various faculties, led by their respective deans, reached the stands after circling the arena, they found places each next to his guest. A second procession consisted of the official staff of the University; the standing committee of convocation; the senate; the court; the representatives of sister universities abroad; the chancellors, vice-chancellors, and principals of universities and university colleges in Great Britain and Ireland; the leaders of London civic life; and finally, the principal officers of the University. Lord Athlone, as its chancellor, and Councillor Fred Howard, mayor of Holborn, received the King and Queen, with whom was Lord Irwin, president of the Board of Education, and presented to them Prof. L. N. G. Filon, vice-chancellor of the University; Mr. S. L. Loney, chairman of convocation; Lord Macmillan, chairman of the university court; Sir Ernest Graham-Little, M.P., chairman of the external council; and Mr. Edwin Deller, Ll.D., principal of the University.

In the course of his address the Chancellor spoke of the abiding faith in the great future of the University held by those who had watched her achievements in the past. "During her span of life," he said, "she has sailed majestically through stormy seas and calm waters as all ships must do that travel a great distance, and is now riding triumphantly on the wave of success and progress. The students in her colleges and under the direction of her teachers number over 12,000 and the numbers of external students are not less." The University had striven to fulfil the great purpose ordained in her charter "to hold forth to all classes, without any distinction whatsoever, an encouragement for pursuing a regular and liberal course of education." But she had never till now possessed a home of her own, suited to her special needs and worthy in spirit and in form of the great city whose name she bears.

The King, in reply, said that the University, of which the Queen and he were proud to be honorary graduates, had now completed a century of distinguished and honoured life, and that all would rejoice to see the beginning of a finely planned group of buildings which would serve as headquarters for her far-reaching work and influence. He continued:

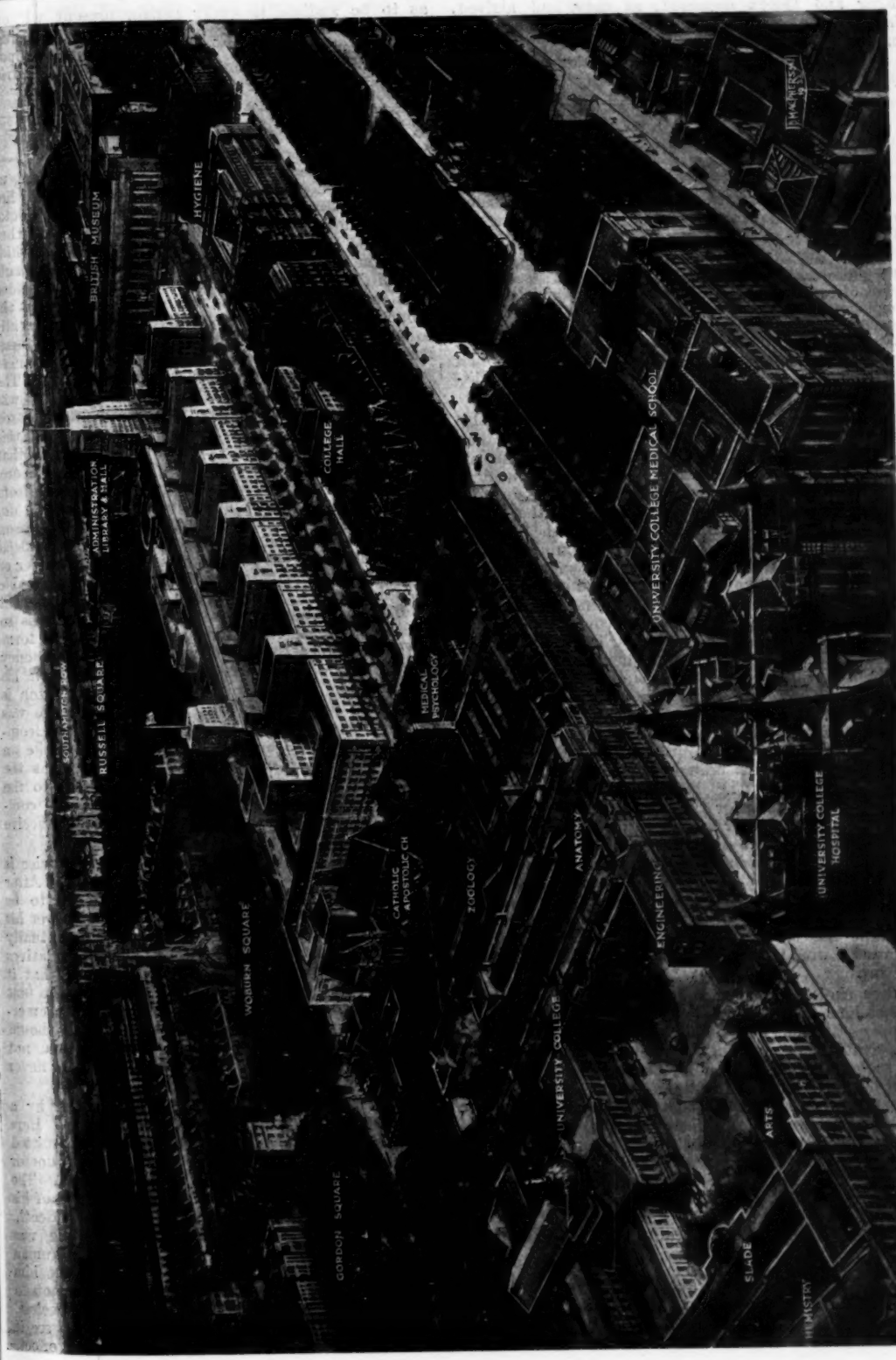
"I count it of good omen that in these difficult times we have the opportunity of showing an unshaken faith in the inestimable benefits of knowledge and education. No less auspicious is the alliance in this good cause between friends of education in the Old World and the New. The Rockefeller Foundation, our own Government, the citizens of London in corporate and in private capacities all share in a memorable achievement.

"In addition to the chancellors of British universities, we welcome here to-day representatives of foreign and dominion universities and of learned societies, whose presence lends a special interest to the proceedings.

"Bloomsbury has long been a centre of learning, and it is appropriate that we should inaugurate here, on this great site, a stately plan of buildings worthy of London and of her University. I hope that this noble enterprise, which has begun so well, may attain an early and triumphant completion."

The Archbishop of Canterbury then offered a prayer and the whole assembly sang a hymn.

The King crossed the dais to the great stone, which was suspended over a block of granite, where representatives of the Students' Union were presented to him. In a cavity in the granite was placed a casket containing documents pertaining to the occasion and coins minted in 1933; and using trowel, mortar, spirit level, and mallet the King, with the guidance of Mr. Charles Holden, the architect, Mr. George Burt, representing the contractors, and four workmen, laid the foundation-stone and declared it to be well and truly laid. A fanfare of trumpets sounded, further presentations were made, and having signed the visitor's book of the University, the



The University quarter as it will look when the buildings are complete

[Reproduced by courtesy of the Illustrated London News

King and Queen departed, as they had arrived, in an open carriage with an escort of household cavalry.

The organisation of this great occasion was beyond praise. The speeches were skilfully amplified so as to be audible to every person present without distortion, and the informal reunion in the huge refreshment tent after the ceremony gave opportunity for personal contact between the dignitaries of the University and their well-wishers.

PANEL AND CONTRACT PRACTICE

Hotel Doctors

THE Panel Committee for the County of London passed the following resolution at its meeting on June 20th :—

"That the committee do confirm the disapproval of this subcommittee (ethical) of the attitude of the management of certain hotels which endeavour to influence their employees to transfer to the lists of the hotel doctors concerned, and that members of the committee be asked to supply the ethical subcommittee with any definite evidence of the practice which they may be able to obtain in order that steps can be taken to secure its discontinuance."

The resolution was the outcome of a complaint by one insurance doctor (Dr. A) against another insurance doctor (Dr. B) that through his patient becoming an employee in an hotel to which Dr. B was the medical officer the management had brought pressure to bear on this insured person to transfer to the list of Dr. B. In the letter from the hotel to the medical secretary the management assure the committee that they fully recognised the insured person's right to free choice of doctor. Dr. B was the company medical officer and was in daily attendance on hotel visitors and staff, which the management contended was in the interests of the staff. It was, however, merely incidental that his name was mentioned to them, and no canvassing whatever was done on his behalf. They had, however, again renewed their standing instruction that no influence is brought to bear upon the staff in this matter. With regard to Miss S, they had made careful inquiries and were satisfied that no pressure was brought to induce the transfer to Dr. B's list. The housekeeper, however, did explain to her that for the convenience of the staff the company's doctor attended insurance patients, and Miss S indicated her willingness to transfer. As she did not hand in her card, she was subsequently reminded that if she still wanted to transfer she should bring her card for that purpose. Subsequently Miss S appeared somewhat undecided, but eventually brought her card. Had she not done so no action whatever would have been taken by them in the matter.

Free choice of doctor is still one of the cherished possessions of the insured person, but it sometimes happens that not only employees of hotels but maids in private houses will have pressure brought to bear on them to change to the doctor who usually attends that house. This insidious pressure does undoubtedly interfere with free choice, and it will naturally help to stop such practices if insurance practitioners will notify the secretary of their panel committee with details of any such case that comes within their own experience. The position is not without risk to the doctor concerned, for if it were proved that such canvassing was done with his knowledge and consent the General Medical Council would have no alternative but to remove his name from the Register.

Emergency Treatment

Two cases of interest came up before the same panel committee and gave rise to much discussion. In the first case a patient fainted. Relatives rang up the insurance practitioner, but as his telephone line was engaged they promptly rang up another doctor who attended, gave the necessary treatment, and then submitted Form R62, the appropriate form on which to claim fees for emergency treatment. The subcommittee which considered the case had decided that they could not pass this claim, largely on the ground that the patient's relatives did not try really to get the proper doctor. They might, of course, have rung up again or even have sent a messenger to the doctor's house, only half a mile distant. The expression used was that "no effective call" was made. The doctor who gave the treatment appeared before the main committee to maintain that this claim should be allowed. He started by saying that he not only practised in the East End but lived there, and that as many of his colleagues lived away from their practices he had much emergency work to do. In this particular case he charged the insured person 5*s*. for the visit and treatment, and gave an official receipt (R52) for the money. In this, as a matter of fact, he was wrong, because this form is only applicable when an insured person fails to prove title to benefit by showing a medical card, whilst stating he is so entitled to treatment. The patient sends this form to the insurance committee, who refund the money paid to the doctor and deduct that amount from his remuneration if, but only if, the insured person is entitled to medical benefit. In this case there was no question of title to benefit, so the insurance committee wrote to the doctor telling him to make an application for an emergency treatment fee, as the 5*s*. paid by the patient was being refunded to the patient through this Form R52. If the panel committee allowed his claim he would then receive 7*s*. 6*d*.

The decision as to whether a particular service is an emergency rests with the panel committee. After considering the facts of the case they have to be satisfied that the patient did seriously try to get his own doctor. Here the main committee eventually decided, telephones being what they are, and relatives being frightened by the patient's condition, that it was reasonable to ring up another doctor as the first line was engaged. The case was therefore an emergency, but that the payment of the fee for it should be deducted from the general panel fund, and not from the insurance practitioner concerned, who never received any message at all.

The second case was an emergency claim by a practitioner who was called to see a dying man. Here no payment was made, but the practitioner submitted an emergency fee claim against the insurance doctor of the patient. The claim was not allowed. The story was that this patient was under the care of his own doctor, who saw him on the day before his death, which was obviously then imminent. As he was dying a natural death, and was beyond any human aid, this doctor told the son who came to see him about 4 A.M. the next morning that he could not do his father any good, and that a visit would be useless. Apparently he was again called about 6.30 to see if the patient was dead and to certify to that effect.

As no visit was made until later in the day the relatives called in Dr. B. The patient died a quarter of an hour after Dr. B's visit. This case could not be allowed as an emergency fee claim because the patient's own doctor was available. The scheme for emergency fees only relates to cases where either the patient's own doctor is not available, or the patient is not able to travel so far to see his own doctor; or, as in the previous case, where the patient is unable to make an effective call. Here the patient's insurance doctor decided not to visit. The relatives, therefore, called Dr. B, who should charge them for his attendance as a private case, but quite clearly it was not a proper claim for the emergency treatment scheme, although some members of the committee apparently disagreed with the chairman's ruling.

It should be pointed out that when the panel committee decide to reject a claim for an emergency fee it is always open (though sometimes difficult) to obtain payment from the insured person as if he were a private patient. The doctor must, however, wait until the panel committee's decision is given before charging a fee.

What is a Partnership?

Dr. C. Luther Batteson writes: "Surely in the comment on What is a Partnership? in your issue of June 17th you are making difficulties unnecessarily. It appears to me that the meaning of the regulation quoted is clear. In the regulation: 'A practitioner will not be deemed to be a partner unless . . . he is entitled to a share of the profits . . . not less than one-third of any other partner.' *Any* obviously includes *all*. If the regulation said *all other* partners, it would be argued that it meant one-third share of the shares of all other partners added together!

"To take your illustration of three partners A, B, and C, taking a fourth partner D; why does he arbitrarily take a third part of C's share? Surely A and B are also partners, and are included in the term 'any other partner'; in which case as he is not precluded from having a share greater than one-third of any other partner his share must not be less than one-third of the share of A, who has the greatest interest in the practice. If A's share is £3825, and D's share is £175, it is impossible to say that D has not less than one-third of any other partner."

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Emergency Treatment of Road Accidents

IN the House of Lords on Thursday, June 22nd, Lord MOYNIHAN moved the second reading of the Road Traffic (Emergency Treatment) Bill.[1] He said this short measure sought to redress certain inequities which urgently required relief. It was not disputed that the Road Traffic Act, 1930, in connexion with Section 36 had had a few unsatisfactory consequences, and the cumulative experience of the medical profession had shown, or at any rate suggested, that not the least of these grievances was concerned with the confident belief entertained now by the public that under the system of compulsory insurance in reference to third parties payment was made almost automatically both to the out-patient departments of hospitals and to general practitioners who rendered emergency treatment. That view, if it was held by anybody, was entirely inaccurate. The general practitioner who attended and rendered first-aid, or as the profession preferred to call it emergency treatment, received in a very large number of cases neither acknowledgment of his services nor payment for them.

With the help of the British Medical Association it had been computed that not more than one medical man in five who was responsible for emergency treatment received either any verbal acknowledgment of the services rendered by him, or any payment for those services. When a payment was received it was only with difficulty, partly because of the fact that the owner of the motor-car lived at a distance from the place where the injury was sustained and partly because of the advice given by insurance companies that any payment made by the owner of a motor-car which had caused an accident was an admission of the guilt of the driver. The cost to the medical man who rendered this first-aid was sometimes considerable. Drugs, dressings, and appliances had to be forthcoming at once, and he had personal knowledge of not a few cases in which a considerable amount of damage had been done to furniture and other things in the doctor's surgery with the result that they had to be renewed or renovated. There was no need to remind their Lordships of the immense amount of gratuitous services rendered to the public of this country by the medical profession. So far as his own experience was concerned he had had inquiry made and found this rough result, that 60 per cent. of the work he had done in connexion with his profession had been unrewarded financially, and he was not in any sense distinguished from the large number of his colleagues who were similarly placed so far as gratuitous services to the public were concerned.

There was, of course, one tribute which he thought the medical profession deserved, and that was in connexion with the voluntary hospitals of the country. All the important services rendered by them, especially in the great teaching hospitals, received no financial, or very slight, financial reward. Among the medical profession it was difficult to obtain unanimity, but if there ever had been unanimity on any point it existed in connexion with what they felt to be an injustice to medical practitioners in connexion with the rendering of emergency treatment. It was not right either morally, or he hoped legally, that services of that kind should be rendered and no payment made in return. He could not say that the medical profession as a whole felt any resentment about the matter, but a certain dismay existed among medical practitioners that their services should be so often demanded and so very rarely rewarded. In the Road Traffic Act, 1930, no provision whatever was made for payment for services rendered in the out-patient departments of the hospitals. Yet in those departments a very considerable expenditure might occasionally be required in the taking of photographs, the application of splints and bandages, the giving of anæsthetics, the suture of wounds, and in other directions, and it was important to point out that both in the out-patient departments of hospitals, and in the consulting-rooms of those who were first called in to treat the patient, such acts were carried out which made in many cases a very considerable difference to the amount which the insurance companies might have to pay. The change from simple to serious conditions was prevented by timely treatment.

The loss to hospitals, so far as in-patient treatment was concerned, was shown in a chart which he had made available for the information of their lordships. So far as out-patient treatment was concerned it had been assessed—he did not say accurately, but as nearly as possible—that 35,000 out-patient treatments were given in a year at a cost of roughly £12,000 and not a penny of that sum was returned to the hospitals. He had proposed in this Bill that the maximum fee payable for emergency treatment

[1] Set out in THE LANCET, June 10th, 1933, p. 1261.

should be three guineas. This sum had been criticised from some quarters as being inadequate, and from others as being excessive. The King Edward Hospital Fund suggested for out-patient treatment a larger sum, but they included in the treatment received massage given, if necessary, to patients after the first attendance. He thought that was perhaps not the best way of securing adequate massage treatment over a long period. At his own hospital, for example, workpeople subscribed £500 a year for massage to be given to their patients, and in other hospitals a similar charge was made. It had been suggested also that the sum of three guineas might be a little excessive; the sum of three guineas, however, was a maximum and there was no reason for the maximum to be reached.

The report of the Road Fund for the years 1930–31 showed that public conveyances were engaged in accidents in 28 per cent. of the total number, private conveyances in 59 per cent., and commercial motors in 13 per cent. In 1931–32 the figures were respectively 19 per cent., 54 per cent., and 36 per cent., and the driver had been held responsible in these three categories in the first year in 62 per cent. of cases, and in the second year in 57 per cent. of cases. It seemed to be no hardship that a preliminary demand should be made upon the driver and the motor vehicle for funds which would pay for the out-patient department treatment and for treatment given by the general practitioner. There were two possible ways by which the driver could secure himself for the payment of this money. The sum paid for a driver's licence might be increased from 5*s*. to 7*s*. 6*d*. On the other hand the insurance premium might be increased by the same comparatively meagre amount. There were, he understood, 2,800,000 motor licences issued in the country to-day, and if half-a-crown was added either to the premium charged by the insurance companies or to the price of a driver's licence a sum which would be more than sufficient, even including administrative expenses, would be then available for the payment of the two groups of people on whose behalf he was pleading that day. He thought that the objection which had been taken by some of the motor journals to payment to medical practitioners and out-patient departments of hospitals out of funds so derived could only be due to prejudice, and prejudice, as it was so often in other directions, was only the emotional reaction of ignorance to truth. When the truth was disclosed, as he thought he had disclosed it that day, he thought that there could be no reasonable objection to his proposal. He understood that the Earl of Plymouth, if the Bill was read a second time, intended to move that it be referred to a select committee, and, if that was the wish of the House, he would be very happy to accept the suggestion.

The Earl of HALSBURY in supporting the second reading, agreed that the Bill for the drafting of which he was largely responsible, was imperfect. He hoped that if the Bill went to a select committee some method would be devised of providing for cases where the driver drove on without stopping and therefore the car could not be identified and the claim made within 72 hours.

The Earl of ONSLOW, the chairman of committees, said he welcomed very strongly the principle which Lord Moynihan had introduced for securing payment to medical men and hospitals for emergency treatment.

Lord DANESFORT said the Bill sought to remedy what was undoubtedly a grave injustice to the medical profession.

The Earl of KINNOULL supported the Bill.

Lord LUKE said he was in perfect sympathy with Lord Moynihan in moving the second reading of the Bill. The King Edward Hospital Fund combined with the British Hospitals Association in order to give evidence before the Select Committee set up to consider Lord Danesfort's Bill dealing with compensation for motor accidents. An amendment has been submitted to that Committee that was likely to meet the hospital view. If Lord Moynihan's Bill was referred to that Committee it would be unnecessary for the King Edward Hospital Fund and the British Hospitals Association to give evidence again, but if the Bill went to another Committee a similar amendment might have to be proposed.

Earl BUXTON, in supporting the Bill, said that he had seldom heard a better case made out by the promoter of a Bill than had been made out by Lord Moynihan.

Viscount KNUTSFORD said he hoped that no weight would be attached to the suggestion of Lord Onslow that this additional tax should be placed upon the motor interests. If that were done the position would be extremely confused. He was also opposed to the suggestion that people besides the medical profession should be compensated for any first-aid that was given. Surely there were enough people now who crowded round any motor accident without the additional attraction of possible compensation. Only professional aid should be compensated. He thought that this extra tax should be put on the driver's licence. An extra half-crown on the cost of a driver's licence would bring in £300,000 a year, and he thought that Lord Moynihan and the British Medical Association would agree that that sum would be more than sufficient to compensate doctors for the services they rendered in the way of emergency treatment.

The Earl of PLYMOUTH (Parliamentary Secretary for the Colonies) said that he entirely agreed that medical practitioners and hospitals had a very real and serious grievance. It was, however, very difficult to find an absolutely suitable remedy which was easy of application and which would not cause any injustice. Lord Moynihan had originally suggested the raising of a central fund contributed to by insurance companies. In the present Bill Lord Moynihan had departed from that method which had something in its favour, and proposed to place liability on the owner of any vehicle which was connected with an accident, irrespective of whether that owner had shown any fault or negligence himself. Special circumstances might exist, but their Lordships ought to realise that this proposal ran counter to the accepted and established principles of jurisprudence. Furthermore, a man who would be liable under the Bill for something for which he might not be responsible would not be given any opportunity of recovering what he had to pay from the person who was actually negligent. A sense of injustice would thus remain which should be avoided if possible. He was advised that an additional levy of 2*s*. 6*d*. on driving licences would produce something like £350,000 yearly, but such a scheme, although it might be suitable, might raise difficulties of its own, and would almost certainly result in a reduction of the voluntary payments at present made. He was not really satisfied that the provisions of the Bill would achieve the immediate objects which Lord Moynihan had in view. Clause 5 dealt with vehicles owned by the Crown. If this Bill proceeded further, as he hoped it would, the Government would have to ask that this clause should be deleted, or at any rate considerably modified.

The Earl of IVEAGH said that as Chairman of the Select Committee to which this Bill was to be referred he welcomed the additional problem because the Committee had had it in their minds for some time. The Committee would also welcome very much the presence of Lord Moynihan to help them in their deliberations.

The Bill was read a second time.

After some discussion on the Select Committee to which the Bill should be referred,

The Earl of PLYMOUTH moved a resolution, "That the Bill be referred to the same Select Committee to which the Road Traffic (Compensation for Accidents) Bill had been referred, and that Lord Moynihan be added to the Select Committee."

The motion in this form was then agreed to.

Public Health in Scotland

On Thursday, June 22nd, the House of Commons went into Committee of Supply on the Civil Estimates for 1933. Sir D. HERBERT (Chairman of Committees) was in the chair.

Mr. SKELTON (Under-Secretary of State for Scotland), after expressing a modified satisfaction in housing progress in Scotland, said that he was not altogether satisfied with the figures which were before the committee in the annual report on maternal and infantile mortality and infectious diseases. A serious and remarkable thing was that maternal mortality had been increasing steadily ever since 1855. An investigation to extend over six months into every case of childbirth in Scotland had been instituted in December, 1932, the results of which should supply very complete data. The infant mortality showed a slight rise. For years it had been definitely higher than the English rate; this might be due to climatic conditions. An epidemic of scarlet fever in Scotland had brought up the cases from 18,000 to 28,000. This raised the question of the importance of immunisation against this and other diseases to which even more would be paid in the future.

The Secretary of State for Scotland had now nominated a committee to deal with the public health services of Scotland (see p. 55).

Mr. DUNCAN GRAHAM thought that the main cause of the increased maternal and infantile mortality was poverty. The Secretary for Scotland ought to raise this matter in the Cabinet and try to get some agreement by which medical benefit would be secured to those who were unemployed, and who were threatened with the loss of medical benefit at the end of this year. It would be generally agreed that if any part of the medical profession had made sacrifices during the last few years it had been the doctors in the rural areas of Dumbarton, Renfrew, and Lanark. He did not think that any more sacrifices should be asked from that section of the medical profession.

Sir ARCHIBALD SINCLAIR said he was glad to hear that the inquiry of the Scientific Advisory Council into maternal mortality was being pressed forward, but he would like to know, in view of the seriousness of the problem, why there was a reduction in the Estimates from £3200 to £2700 in the grant for the training of midwives and health visitors.

Mr. MCGOVERN moved to reduce the vote by £100. He said not enough was being done in housing.

Captain ARCHIBALD RAMSAY said there was something like 20,000 men in Scotland who fell out of covenanted National Health Insurance benefit in December last. All the parties concerned—the patients and the doctors who were responsible for the health and welfare of these men, as well as the insurance committees—were all of the same opinion, namely, that if it could possibly be arranged administratively it would be in the interests of all that these 20,000 patients should not be transferred to the care of new doctors with the loss of time and money that must necessarily be involved, and the general dislocation that the patient must endure when he changed his medical officer. He thought that by some adjustment of either local or national machinery, or perhaps both, this difficulty could be got over.

Mr. SKELTON, replying to the debate, said that when the evidence taken during the examination into the question of maternal mortality was considered by experts it might be possible to trace the cause of puerperal sepsis and to tell whether it was more frequent in institutions or in childbirths at home. As regarded infantile mortality, it seemed the variability of climate was a very strong factor, and his own judgment from the information before him was that the hard times through which the country was passing were a very important factor. In regard to the withdrawal of medical insurance benefits from those who had been unemployed for a certain period, while it might be possible to deal with the matter by some administrative manipulation—and he was not confident that it was possible—such action would require the consideration of the Cabinet because it would involve an alteration of policy from that of the 1932 Act.

The motion to reduce the vote was rejected by 149 votes to 29.

Manchester Royal Infirmary Bill

On June 26th, in the House of Commons, the Manchester Royal Infirmary Bill (which has been changed from the Manchester Corporation Bill) was read a second time.

HOUSE OF COMMONS

MONDAY, JUNE 26TH

Indian Medical Service

The Duchess of ATHOLL asked the Secretary of State for India the number of British and Indian officers, respectively, serving in the Indian Medical Service in 1920, 1921, and 1932.—Sir S. HOARE replied: The earliest return giving the composition of the All-India Services is that for the year 1922. The figures for the Indian Medical Service (Civil) for the years 1922 and 1932 are as follows:—1922: European, 326; Indian, 35; total, 361. 1932: European, 195; Indian, 97; total, 292.

Clinic for School-children in Leyton

Sir WILFRID SUGDEN asked the Parliamentary Secretary to the Board of Education what further provision was to be made for the borough of Leyton, Essex, by way of clinics as to the sight, hearing, throat, and limb care of the school-children of that borough; and if he would consider dealing with the younger children upon the lines of the Margaret Macmillan type of school.—Mr. HERWALD RAMSBOTHAM replied: With regard to the first part of the question, plans for a new clinic to deal with minor ailments, refraction, and dental work, were approved by the Board of Education in July, 1932. The clinic is being built and is expected to be ready this year. As regards the second part of the question, my noble friend is unable in present financial circumstances to entertain proposals for new nursery schools.

TUESDAY, JUNE 27TH

Cases of Nystagmus

Mr. TOM SMITH asked the Home Secretary how many cases of nystagmus were certified in each of the years from 1920 to 1932 inclusive.—Sir JOHN GILMOUR replied: The number of cases of nystagmus for which certifying surgeons in Great Britain gave certificates of disablement during the years 1920 to 1931 inclusive were as follows:—

1920	2216	1923	4050	1926	1863	1929	2677
1921	1986	1924	3446	1927	2205	1930	3248
1922	4047	1925	3564	1928	2515	1931	2829

The tabulation of the figures relating to the year 1932 is not yet complete. In a certain number of the above cases the decision of the certifying surgeons will have been reversed by the medical referee, but precise figures are not available.

NEW HOSPITAL FOR BLACKPOOL.—Lord Derby recently laid the foundation-stone of a new building to replace the present Blackpool Victoria Hospital which the medical report for 1932 declares to be out of date. During the year the wards, especially the female ward, were at times overcrowded. The accommodation of the out-patient department is so "insufficient and unsuitable" that the work of the staff is "greatly handicapped." Last year there were 2519 in-patients; the average daily number of beds occupied was 109, and the average stay in hospital was 15·83 days. The new building will eventually cost £200,000; the first part, now begun, will cost £150,000. The site is at Whinney Heys, on the borders of Stanley Park, the highest and quietest part of the town. The immediate undertaking comprises the administrative block, casualty receiving department, children's ward of 28 beds, paying patients' ward of 16 beds, surgical ward of 65, medical ward of 36, and maternity ward of 32 beds.

MEDICAL NEWS

University of Oxford

In a congregation held on June 22nd the following degrees were conferred :—

D.M.—C. W. C. Bain and A. M. Cooke.
B.M.—E. J. Baldwin.

At recent examinations the following candidates were successful :—

Pathology.—P. C. Alexander, D. R. Balcombe-Brown, J. H. Bartlett, G. E. M. Benson, C. A. Boucher, D. G. Burgess, Roy Clarke, P. E. Cresswell, K. B. Dawson, H. Fidler, J. H. T. Hanington, E. C. O. Jewesbury, R. Passmore, J. C. Prestwich, J. E. Scott-Carmichael, R. G. Silver, B. B. Waddy, and E. M. Fisher.

Pharmacology.—R. I. Bence, H. S. Brodribb, H. Burton, M. C. Chapman, R. N. B. Cridland, D. I. Crowther, H. Fidler, G. F. C. Hawkins, G. A. Hodgson, J. E. Lovelock, H. G. Lowden, W. P. Mallinson, C. I. Murphie, T. E. Ooi, R. Roaf, R. G. Silver, W. R. Trotter, J. W. A. Turner, C. B. I. Willey, G. M. Afoumado, and A. J. M. T. Barnes.

Forensic Medicine and Public Health.—J. E. Ayoub, H. J. Barrie, E. M. Buzzard, P. E. Cresswell, E. P. Edmonds, M. H. Evans, W. H. Fawcett, G. E. Godber, M. S. Good, G. S. Grist, J. H. T. Hanington, R. Kempthorne, R. W. G. Lancashire, J. W. Litchfield, P. H. Lomax, W. F. de C. Veale, and M. A. Jennings.

Medicine, Surgery, and Midwifery.—J. E. Ayoub, H. J. Barrie, H. R. Balhurst-Norman, J. H. B. Beal, G. E. M. Benson, F. E. Buckland, A. Carling, M. H. Evans, E. Fowler, I. H. Gosset, T. T. Hardy, D. A. Jennings, R. Kempthorne, J. E. Lewis, P. J. W. Milligan, J. E. Morley, P. E. F. Routley, René Thomas, C. M. Vaillant, Clifford Wilson (all these completing course for degrees of B.M., B.Ch.), and J. P. Child.

University of Cambridge

At recent examinations the following candidates were successful :—

THIRD EXAMINATION FOR M.B., B.CHIR.

Part I.: Surgery, Midwifery, and Gynæcology.—S. T. Anning, T. M. Bell, N. B. Betts, W. R. Billington, G. O. A. Briggs, J. C. Buckley, F. Clifton, E. L. Cohen, W. J. B. de Gruchy, J. H. Dixon, A. B. Evans, S. M. Evans, G. L. Foss, W. R. Gavin, W. E. F. Gough, E. M. Griffin, E. R. Hargreaves, N. H. Harwood-Yarred, J. D. Hay, E. C. Herten-Greaven, G. T. Hindley, A. C. L. Houlton, W. R. S. Hutchinson, L. G. Irvine, G. H. Jennings, A. Kekwick, J. H. Lankester, J. C. Lee, R. S. Lewis, W. H. Lewis, M. K. Martyn, F. S. A. Maw, W. B. Mumford, W. F. Nicholson, G. S. W. Organe, E. W. Price, E. G. Pyne, L. R. J. Rinkel, G. C. D. Roberts, H. J. M. Robinson, M. A. Rugg-Gunn, J. H. Shakespeare, J. Smart, J. T. W. Spiridion-Kliszczewski, S. M. Thompson, O. A. Trowell, J. G. Vincent Smith, E. O. Walker, G. E. Walker, H. C. M. Walton, W. F. Walton, G. L. Ward, V. H. Wilson, P. L. Holliday, F. C. Naish, M. C. A. Robson, R. A. Rushton, and E. D. Thompson.

Part II.: Principles and Practice of Physic, Pathology, and Pharmacology.—G. L. Alcock, S. T. Anning, W. C. Barber, H. Barcroft, G. F. Barran, C. G. Batty-Smith, W. T. C. Berry, E. J. M. Bowlby, G. O. A. Briggs, K. L. Buxton, R. Cairns, C. M. Carr, A. H. Charles, E. L. Cohen, A. G. Cross, W. Dykes Bower, G. L. Foss, P. H. R. Ghey, J. N. Groves, M. I. A. Hunter, W. R. S. Hutchinson, L. G. Irvine, J. G. Jones, D. Kyle, A. W. Langford, A. B. MacGregor, W. S. McKenzie, T. C. Maling, J. W. Maycock, A. Miller, M. P. Morel, J. G. More Nisbett, H. J. V. Morton, B. C. Murless, R. Q. Parkes, E. W. Price, J. S. M. Pringle, S. A. Propert, I. G. Robin, G. Scott, E. Sharp, E. P. Sharpey-Schafer, D. W. Smithers, J. G. C. Spencer, R. A. Sykes, E. W. Taylor, G. W. Thomas, H. B. Tipler, O. A. Trowell, T. M. Tyrrell, G. I. Watson, R. H. H. Williams, J. Wilson, D. K. Emery, and M. Sutcliffe.

University of Wales

At recent examinations the following candidates were successful :—

D.P.H.

Part I.—G. J. Roberts, Jean J. Smith, and Anne E. Williams-James.

Society of Apothecaries of London

At recent examinations the following candidates were successful :—

Surgery.—J. L. Cope, Univ. of Cambridge and Westminster Hosp.; S. A. De Souza, St. Mary's Hosp.; H. M. El Magidi, Univ. of Birmingham; T. E. Mitchell, Guy's Hosp.; and P. J. Purcell, St. Mary's Hosp.

Medicine.—W. H. Ekin, Univ. of Cambridge and Westminster Hosp.

Forensic Medicine.—E. Cohen, S. Gurevich, and S. G. Nathan, Charing Cross Hosp.; and A. W. Turner, St. Mary's Hosp.

Midwifery.—E. C. Dax, St. Mary's Hosp.; T. Gardner, Univ. of Leeds; A. E. Glanvill, Univ. of Birmingham; N. C. Lendon, St. Mary's Hosp.; and R. M. Outfin, Guy's Hosp. and Univ. of Bristol.

The following candidates having completed the final examination, are granted the diploma of the Society entitling them to practise medicine, surgery, and midwifery: W. H. Ekin, A. E. Glanvill, S. Gurevich, and T. E. Mitchell.

University of London

At a meeting of the Senate on June 21st, Prof. L. N. G. Filon, F.R.S., was re-elected vice-chancellor for the year 1933–34.

The title of university professor of medical entomology was conferred on Dr. P. A. Buxton in respect of his post at the London School of Hygiene and Tropical Medicine, and the title of university professor of pharmacology on Dr. J. H. Burn in respect of his post at the College of the Pharmaceutical Society.

Mr. R. A. Fisher, F.R.S., who since 1919 has been engaged on scientific research in the statistical department at Rothamsted Experimental Station, was appointed Galton professor of Eugenics at University College.

University Studentships.—A post-graduate travelling studentship has been awarded to Archibald Gilpin, M.D. (King's College Hospital). It will be held for one year, and Dr. Gilpin will carry out research in Freiburg and Vienna on the physiology and pathology of the thyroid gland and on problems especially related to sporadic goitre and thyrotoxicosis.

The studentship in physiology has been awarded to Hugh Alexander Dunlop, M.D. (Westminster Hospital), who will carry on physiological research at King's College.

University of Glasgow

On June 21st the honorary degree of LL.D. was conferred on Dr. William Blair Bell, emeritus professor of surgery in the University of Liverpool. Among other recipients of the degree were Prof. Albert Einstein and M. Herriot.

Ordinary degrees were conferred on the following :—

D.Sc.—Amy M. Fleming, M.D.
M.D.—Mary A. Griffin and D. R. MacCalman (with high commendation); James Grant and A. W. Russell (with commendation); and J. W. MacG. Alexander and F. W. Martin.

University of Leeds

At a meeting of the council on June 21st, Prof. Harold Collinson, M.S., was elected to the chair of surgery, carrying the headship of the department of surgery, as from the beginning of next session, in succession to Prof. J. F. Dobson; and Mr. Alfred Richardson, F.R.C.S., was elected to the chair of clinical surgery in succession to Prof. Collinson. Mr. E. R. Flint, F.R.C.S., was appointed director of surgical research, in succession to Mr. L. R. Braithwaite, and Dr. S. J. Hartfall was appointed honorary demonstrator in medical pathology.

Epsom College

The eightieth annual general meeting of the Governors of Epsom College was held on Friday, June 23rd, 1933, at the Office, 49, Bedford-square, W.C., Lord Burnham, the President, being in the chair. In announcing the result of the election of pensioners and foundation scholars, the President commented on the pains taken by the conjoint committee to elect as foundationers the most deserving boys who at the same time would appear to be the most capable of utilising their great opportunity, and stated that the boys' fathers had practised in various parts of Great Britain: one in Glasgow, three in Lancashire, two in Yorkshire, one in Ireland, one in Sussex, one in Cheshire, one in Devonshire, and one was in the Indian Medical Service. The names of the successful candidates were published in THE LANCET last week. In presenting the annual report of the Council the President asked the Governors to join him in congratulating Dr. Raymond Crawfurd, the Chairman of the Council, on the honour of Knighthood. Dr. Crawfurd then gave an interesting résumé of the works carried out at the College in the course of the past ten years, during which period the Council had endeavoured to do what normally would have taken 100 years. The report was unanimously approved.

Dr. R. Prosser White was elected a Vice-President of the College in appreciation of his generosity in founding prizes for the study of French and German or Spanish.

University of Liverpool

Dr. William Mowll Frazer, medical officer of health for the city and port of Liverpool, has been appointed to the chair of hygiene.

The Freemasons' Hospital

On Wednesday, July 12th, the King will open the new Freemasons' Hospital at Ravenscourt Park, Hammersmith. He will be accompanied by the Queen.

British Post Graduate Hospital and Medical School

The foundation-stone of the new building at Hammersmith is to be laid on July 17th. It is estimated that the scheme now to be carried out will cost about £200,000.

Central Middlesex County Hospital, Willesden

The new children's wing and electrical department of this hospital is being opened on Friday, June 30th, at 3 P.M. by Sir George Newman, chief medical officer of the Ministry of Health.

Hospital for Sick Children, Great Ormond-street

On Friday, July 7th, the Princess Royal will lay the foundation-stone of the nurses' house which is the first stage of the reconstruction which this hospital hopes to carry out.

Physiological Society

A meeting of this society will be held to-day, Saturday, July 1st, at 3.30 P.M., in the university laboratory of physiology at Oxford. The proceedings will open with a communication by Dr. C. E. Brunton on the pH of arterial blood during gastric secretion. The society will meet again at the Marine Biological Laboratory, Plymouth, on August 18th.

Visits to London Buildings

Four tours of historic London buildings have been arranged by King Edward's Hospital Fund during this month. On Wednesday, July 5th, at 11 A.M., Lord Onslow will be guide to a tour round the Houses of Parliament, and on July 13th, 22nd, and 25th parties will visit Westminster Abbey, the India Office, and Somerset House. Tickets may be had from the secretary of the Fund, 10, Old Jewry, London, E.C. 2.

Paddington Medical Society

At the annual general meeting of this society held on June 13th, Dr. W. G. Bendle was elected president, Dr. G. E. Oates vice-president, and Dr. Saul Crown hon. secretary for the ensuing year.—At the next meeting, to be held at the Great Western Royal Hotel, Paddington Station, on July 11th, at 9 P.M., Sir James Purves-Stewart will give an address entitled Medical Impressions of Soviet Russia.

Committee on Scottish Health Services

The Secretary of State for Scotland has appointed a committee "to review the existing health services of Scotland in the light of modern conditions and knowledge, and to make recommendations on any changes in policy and organisation that may be considered necessary for the promotion of efficiency and economy." The chairman is Sir John Dove-Wilson, K.C., formerly president of the Supreme Court of Natal; and the members include: Mr. George Bonar, of Dundee; Dr. James L. Brownlie, chief medical officer of the Department of Health; Mr. Ian Carmichael, a well-known local administrator in Lanarkshire; Prof. E. P. Cathcart, M.D., F.R.S., professor of physiology, University of Glasgow; Dr. Robert W. Craig, of the Scottish Section of the British Medical Association; Provost David Fisher, of Hawick; Prof. Alexander Gray, professor of economics in the University of Aberdeen; Sir Andrew Grierson, town clerk of Edinburgh; Dr. John Jardine, of the Scottish Education Department; Dr. A. S. M. Macgregor, chief medical officer of Glasgow; Lady (Leslie) Mackenzie; Mr. W. M. Marshall, clerk to the Scottish Association of Insurance Committees; Mr. Alexander Miles, F.R.C.S.; Bailie Violet Roberton, of Glasgow; Mr. J. M. Vallance, of the Department of Health for Scotland; and Mrs. A. M. Chalmers Watson, M.D. The secretary of the committee is Mr. Niven F. McNicoll, of the Department of Health for Scotland, 121a, Princes-street, Edinburgh, to whom all communications should be addressed.

University of Bristol

The medical school of the University is celebrating its centenary this week-end, and all present and former members have been invited to take part in the celebrations which are taking the form of a reception at the Bristol Royal Infirmary, a dinner at the University Union, and the conferment of ordinary and honorary degrees in the great hall. This afternoon (Saturday, July 1st) the celebrations close with a garden party at the house of the sheriff of Bristol. These functions have been announced in our columns already.

St. George's Hospital

An evening conversazione was held on Tuesday last at St. George's Hospital to mark the occasion of the bicentenary, when a large company of old students and their relatives, as well as a number of representative guests, assembled in the institution. The proceedings were admirably organised, the board-room and the various theatres being prepared for entertainment, both of a scientific character and of the opposite. Sir William Bragg lectured on the Crystals of the Living Body; Mr. E. G. Boulenger gave an interesting discourse on what went on behind the scenes at the Zoo; and Mr. Rex Horsfield demonstrated the photo-electric cell, "the electric eye." Cabaret performances were arranged by Dr. H. E. Mansell with the generous coöperation of well-known broadcasting artistes.

London Hospital Medical College

Speaking at the annual prize-giving on June 27th, Prof. William Wright, the dean, referred to the formation within the hospital during the past year of special departments for diseases of the heart and for brain surgery. Technical methods of examination and treatment had become so elaborate that it had been judged necessary to create these departments in order to fulfil one of the primary purposes of a large medical school—the extension of knowledge. Fortunately the hospital was so large that there would remain ample clinical facilities for the other great purpose—the education of students in general routine methods of diagnosis and treatment. The changes would result in additions to the honorary staff, and Mr. Charles Donald had been elected an assistant surgeon. In the aural department Mr. Donald Wheeler had been elected assistant surgeon in succession to Mr. Geoffrey Carte, and as lecturer in chemistry in the medical college Mr. F. W. Bury had succeeded Mr. Hugh Candy. During the year various structural alterations had been made in the college, providing in particular a new histological laboratory—an improvement rendered possible by a legacy from Dr. Ewan Frazer. The entry of students had been greater than any since the end of the war, and the list of examination successes had been notable. In sport the students had acquitted themselves creditably in several fields, without, however, attaining first places except in cross-country running and sailing. The Armitage cup for rifle shooting was lost by only a single point, and both the Rugby XV. and the Association XI. reached the semi-final round. Mr. B. H. Page had set up a record for the mile at the University of London sports, and equalled a 40-years' record for the same distance at the inter-hospital sports. Prof. Wright concluded his speech by appealing for further support for the students' hostel. The appeal committee had succeeded in obtaining a promise of a site from the house committee and in raising £15,000—about half the sum required. The offer of a loan of £10,000 on favourable terms had been received, but the problem of raising at least a further £5000 remained.

The Dean of St. Paul's, in presenting the prizes, said that he considered the clergy belonged to the healing profession, and he hoped that in the future the aspect of physician of the soul would be made more of, and that it would be placed on a more scientific basis than at present. Many were the occasions when medical and clerical consultations could be valuable, particularly as many human troubles were directly connected with questions of sex.—Sir William Goschen, chairman of the house committee, moved a vote of thanks to Dean Inge, and Dr. Cecil Wall, in seconding, gave an interesting sketch of the history of the power given to deans of St. Paul's to grant licences to practise medicine, surgery, and midwifery in London.

Welsh National School of Medicine

Dr. Ralph Picken has been appointed the Mansel Talbot professor of preventive medicine in succession to Prof. E. L. Collis, who is retiring.

Dr. Picken, who is 49 years of age, was born in the Isle of Arran and received his medical education at the University of Glasgow, where he graduated B.Sc. in 1905 and M.B. with honours in 1908. In 1911 he took the diploma of public health at Cambridge, and after holding various posts in the counties of Dumfries and Renfrew he became in 1913 assistant medical officer to the public health department of Glasgow. In 1921 he was appointed medical officer of health to the city and port of Cardiff, acting also as school medical officer and lecturer in public health to the Welsh National School of Medicine.

Dr. R. St. A. Heathcote has been appointed independent lecturer in materia medica and pharmacology.

Fellowship of Medicine and Post-Graduate Medical Association

There will be a week-end course in general medicine and surgery at the General Hospital, Southend-on-Sea, on July 8th and 9th. On Friday, July 7th, there will be an antenatal demonstration at the Royal Free Hospital at 5 P.M. On Thursday, July 13th, from 4–6 P.M., Dr. Peter Kerley will give a demonstration of X ray films at the Medical Society of London. There will be an all-day course in proctology at St. Mark's Hospital from July 3rd to 8th. Forthcoming courses include a course in ophthalmology at the Royal Westminster Ophthalmic Hospital from July 10th to 29th; a course in dermatology at the Blackfriars Skin Hospital from July 10th to 22nd; a course in practical pathology at the Brompton Hospital from July 10th to 22nd; and a course in urology at the All Saints' Hospital from July 10th to 29th. Further particulars may be had from the secretary of the association at 1, Wimpole-street, London, W. 1.

Forthcoming Congresses

Meetings which have been arranged for the second half of this year include the following:—

July 4th–9th	International Congress for Child Welfare	Paris.
July 5th–8th	Oxford Ophthalmological Congress	Oxford.
July 5th–7th	Royal Medico-Psychological Association	Clacton-on-Sea and Colchester.
July 5th–7th	English-speaking Conference on Maternity and Child Welfare	London.
July 7th–9th	Industrial Welfare Society	Bristol.
July 8th	Medical Conference on Contraception	London.
July 10th–15th	International Society of Urology	London.
July 13th–15th	National Association for the Prevention of Tuberculosis	Cardiff.
July 19th–22nd	International Society of Orthopædic Surgery	London.
July 20th–22nd	International Pædiatric Conference	London.
July 25th–29th	British Medical Association	Dublin.
Aug. 13th–27th	Tomarkin Foundation Post-graduate Course	St. Moritz.
Aug. 20th–26th	International Congress for Experimental Cytology	Cambridge
Sept. 7th–9th	Association Professionnelle Internationale des Médecins	London.
Oct. 4th–8th	International Congress of Hydrology, Climatology, and Medical Geology	Toulouse.
Oct. 12th–14th	French Congress of Radiology	Paris.
Oct. 13th–14th	French Society of Plastic Surgery	Paris.
Oct. 23rd–25th	French Therapeutic Congress	Paris.
Oct. 25th–30th	International Congress on Cancer	Madrid.

Association of Surgeons

The Association of Surgeons of Great Britain and Ireland offer a scholarship of £350, to be held for one year. The holder will be expected to pursue a definite line of research or to study surgery in specified clinics at home or abroad. Application must be made before Sept. 30th to the hon. secretary, Mr. Julian Taylor, 65, Portland-place, London, W. 1. Further particulars will be found in our advertisement columns.

Medical Conference on Contraception

A conference will be held in the Great Hall, B.M.A. House, Tavistock-square, London, W.C., on Saturday, July 8th. In the morning Mr. C. W. Bellerby will speak on Recent Researches on Temporary Hormonic Sterilisation, Prof. Julian Huxley presiding; and Mrs. L. M. Jeffreys, M.D., Mrs. F. Ivens-Knowles, M.S., and Dr. A. G. M. Severn will speak on Public Health Authorities and Information on Contraception, Dr. Helena Wright presiding. Lord Horder will take the chair at the afternoon sessions when Mr. John Baker, Ph.D., and Mr. H. M. Carleton, Ph.D., will speak on Chemical Spermicides and their Effects, and Dr. E. F. Griffith on General Practice and Information on Contraception. Further information may be had from the secretary of the National Birth Control Association, 26, Eccleston-street, London, S.W. 1.

Medical Diary

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, July 4th.—5 P.M., Annual General Meeting of the Society.

THURSDAY.—5.30 P.M., UROLOGY. Dr. H. G. Bugbee (New York): Conservation in Urology.

BIOCHEMICAL SOCIETY.

SATURDAY, July 8th.—2.30 P.M. (at the Rothamsted Experimental Station, Harpenden). Communications: 1. D. C. Harrison: The Action of Vitamin C on Tissues in vitro. 2. E. B. Anderson and L. J. Meanwell: Studies in the Pasteurisation of Milk. 3. E. Smith, D. Hughes, G. F. Marrian, and G. A. D. Haslewood: A New Trial from the Neutral Fraction of Pregnant Mare's Urine Extract. 4. L. R. Bishop: The Proteins of Barley Grain. 5. A. G. Norman: Observations on the Cellulosans of Straws. 6. E. H. Richards and D. W. Cutler: Biological Filtration of Trade Wastes. 7. F. M. L. Sheffield: The Chemical Simulation of Virus Effects. 8. F. G. Gregory: The Influence of Nitrogen and Potassium on Respiration in Leaves of Barley.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, July 3rd, to SUNDAY, July 9th.—ROYAL FREE HOSPITAL, Gray's Inn-road. Frid., 5 P.M., Antenatal Treatment.—NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street. Course in Cardiology occupying the whole of each day.—CHILDREN'S CLINIC, Cosway-street, Marylebone-road. Post-graduate Course in Children's Diseases. Afternoons and some mornings.—PRINCE OF WALES'S HOSPITAL, Tottenham. General Post-graduate Course in Medicine, Surgery, and the Specialties occupying the whole of each day.—ST. MARK'S HOSPITAL, City-road. Course in Proctology, all day.—GENERAL HOSPITAL, Southend-on-Sea. Sat. and Sun. Week-end Course in General Medicine and Surgery, all day.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith-road, W.

MONDAY, July 3rd.—10 A.M., Medical Wards, Skin Clinic. 11 A.M., Surgical Wards. 2 P.M., Operations, Medical, Surgical, Eye, and Gynæcological Clinics.

TUESDAY.—10 A.M., Medical Wards. 11 A.M., Surgical Demonstration. 2 P.M., Operations, Medical, Surgical, and Throat, Nose, and Ear Clinics. 4.15 P.M., Mr. Green-Armytage: Common Diseases during Pregnancy.

WEDNESDAY.—10.30 A.M., Medical and Children's Wards, Children's Clinic. 2 P.M., Gynæcological Operations, Medical, Surgical, and Eye Clinics.

THURSDAY.—10 A.M., Neurological Clinic. 11.30 A.M., Fracture Demonstration. 2 P.M., Medical, Surgical, Eye, and Genito-urinary Clinics.

FRIDAY.—10 A.M., Skin Clinic. 12 noon, lecture on Treatment. 2 P.M., Operations, Medical, Surgical, and Throat, Nose, and Ear Clinics.

SATURDAY.—10 A.M., Medical Wards, Children's and Surgical Clinics. Surgical Wards.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.

WEDNESDAY, July 5th.—4 P.M., Dr. Stanley Wyard: Some Principles of the Diagnosis of Gastric Cases. (Lantern slides.)

NOTES, COMMENTS, AND ABSTRACTS

APPLIED PHYSICS

THE National Physical Laboratory chooses every year, on the occasion of the formal visit of the general board, to turn itself into an exhibition for guests, possibly in order to give up only one instead of two precious working days. On June 27th, the date of this year's visitation, guests were received by Sir Gowland Hopkins in the high voltage laboratory—a spot which has an invigorating sound to the meek until they recall associations with the electric chair. From this alarming parlour visitors were allowed to wander to the various buildings; and here they saw wind tunnels for testing aeroplane models, ship tanks for the study of ship propulsion, instruments for measuring small differences in shades of colour, synthetic lightning, and in the radio department an electron stop-watch which might have been invented by Jules Verne.

Experiments having a special interest for medical visitors include those designed to improve the efficiency of refrigeration plants. As refrigeration in relation to foodstuffs is an industry involving millions of pounds a year, any economies which can be made in it are of great importance. Most refrigeration plants circulate cold brine through banks of pipes in a large chamber, thus cooling the air, and the efficiency of the plant depends on the amount of this heat transfer. Recently, better results have been obtained at the laboratory by circulating the air over such banks of pipes in a wind tunnel. The transfer of heat from the air to the cooled pipes is much increased by breaking up the current of air by means of a series of spaced wooden bars. The increased turbulence necessitates the use of more power to drive the fan circulating the air, and experiments are being made to decide how far this increased power consumption offsets the gain in heat transfer. Another experiment of considerable practical importance is that demonstrating the recovery of the eye after exposure to glare. Motorists and cyclists both suffer from the dazzle which blinds them after meeting a car with powerful headlights; an aeroplane pilot searching for an airway beacon may suffer in the same way after glancing at his illuminated instrument board. An elaborate apparatus, depending on the observation of recurring flashes of light, has been arranged to measure the rate of recovery; other experiments have been designed to demonstrate the effect of pupil size on luminous efficiency: this is not uniform over the whole of the pupil as was formerly assumed, but efficiency is actually greatest at the centre of the pupil, diminishing towards the periphery. The whole process of testing clinical thermometers was shown, great accuracy in checking and counter checking being observed. The glass is examined radiologically to ensure that lead glass is used; repeated tests have shown that this is a satisfactory glass for thermometers, and it is therefore given preference over other kinds.

In the X ray department experimental realisation of the Rontgen (r), the unit of X ray quantity, has been achieved. A few years ago American, German, and English standards differed by as much as 40 per cent., but with modern methods of standardisation, which depend on the ionisation produced in air by the rays to be examined, differences of standard are within 0·5 per cent. The older thimble-chamber apparatus was used for standardisation in the past, and a thimble apparatus calibrated against the new standard is probably accurate within 5 per cent. The Pastille dose was probably accurate only within limits of about 20 per cent., so that the new method of standardisation offers a considerable advance.

An enthralling exhibit in the aerodynamics department demonstrated the value of model tests to show the effect of "buffeting" on aeroplane tails—a phenomenon which has a distinct influence on the health of the pilot. When the main wing of the plane is inclined at a large angle of incidence it sheds behind it a succession of eddies at fairly regular intervals, and these may strike the tail plane if it occupies an unfavourable position in relation to the wings. Vibration of the tail may result, and if very severe the tail plane might actually be broken, so that a crash would be inevitable. It is thought that the Meopham accident in 1930 was due to buffeting. With model aircraft, the buffeting of the tail can be shown for different altitudes, and the flow of air over the wings is demonstrated by the behaviour of short wool streamers. By the use of such models it will be possible to predict the degree of buffeting to be expected in any type of machine, and to demonstrate the value of devices for overcoming it. It is unfortunate that the low-wing monoplane, which is enjoying an increasing popularity among flying enthusiasts, is thought to be particularly liable to buffeting.

The guests showed keen appreciation of the privilege of inspecting a laboratory whose routine work is hardly less stimulating than its manifold research activities.

STRANGEWAYS RESEARCH LABORATORY

THIS laboratory has become a recognised training centre at which workers from all over the world may acquire the technique of tissue culture. The annual report for 1932 shows advance in knowledge in every field approached, and the brief account of results here set out gives little indication of the labour involved in their production. The new extension of the laboratory buildings, made possible by a bequest of the late Sir Otto Beit, has been in use since January, and has enabled the laboratory to collaborate with the university department of physiology; for this purpose a physiological section has been established under the supervision of Mr. E. N. Willmer. The work of the new section has included a study of the growth of embryonic fowl heart fibroblasts in various media, with the object of making a more exact analysis of the processes by which growth takes place, and of estimating the growth-promoting capacity of different media. By photographing a portion of the field of growth of a culture every six minutes it is possible to obtain direct measurements of the movements of cells in the field and to estimate the number of cell divisions. Mr. Willmer has found that cells grown in plasma show greater activity in the presence of embryo extract than in the presence of Tyrode's solution; the difference in division rate of cells under the two conditions makes it probable that this method can be used to investigate the growth-promoting properties of various media. Miss C. F. Fischmann has begun the investigations into the effect of vitamins upon tissue growth and differentiation which were foreshadowed in last year's report. Dr. F. G. Spear, in collaboration with Mr. L. G. Grimmett at the Westminster Hospital, has completed, as far as possible, his work on biological response as a function of the intensity of gamma radiation. He has taken reduction of cell division as the criterion of effect, and has found that there is a critical intensity of gamma radiation at which the biological response can be brought about with minimum dose; beyond this intensity the dose necessary to achieve a given effect remains nearly constant over a wide range of intensities, and below the critical intensity the dose has to be much increased in order to produce the same biological response. Analogous results have been obtained by Miss S. F. Cox, who finds, using X and gamma radiation, that a given dose of irradiation, delivered at one intensity, causes a fall in mitosis in vitro followed by a compensatory rise; but that the same dose given with a greater intensity causes a fall in mitosis without any subsequent compensatory increase. Other work of the laboratory includes cinematography of avian

blastoderms in vitro after experimental treatment (in collaboration with St. Bartholomew's Hospital), the elaboration of a technique for the cultivation in vitro of rabbit blastoderms, investigation of chondrogenesis in cultures of endosteum, and of the artificial calcification of the hypertrophic cartilage in the embryonic long bones of the fowl, a study of erythropoiesis in vitro, and various studies on the rat retina. Miss Honor Fell, D.Sc., director of the laboratory, made a visit to America during the year to give a demonstration to the sixth International Congress of Genetics at Cornell University.

A PLACE OF REST AND RECUPERATION

IT is nearly five years since we called attention to the amenities of Backsettown, Henfield, a fourteenth century house in Sussex adapted to provide a luxurious rest house for those in need of solitude, quiet, and complete freedom from responsibility for a period. The luxury consists in comfortable beds, constant hot water, well-chosen and cooked food, admirable service, and, not least, in privacy; for though there are public rooms, guests may have their meals in bed or in the garden without extra charge and without having to invent good reasons for their whim. The matron is a fully trained nurse and two doctors are available at call; but the house is designed for people who do not require actual sick nursing, though convalescents are welcome. A vitamin-rich diet is maintained not only by the home-grown vegetables, but by the recent addition of dairy produce from cows kept under hygienic conditions. Particulars of charges and accommodation may be obtained from the hon. secretary, Miss Evelyn Fellows, 15, Eaton-gardens, Hove. Applications for admission should, if possible, include a letter from the patient's own doctor.

Appointments

COMERFORD, J., M.B., B.Ch. N.U.I., has been appointed Medical Officer, Borstal Institute, Clonmel.

Certifying Surgeons under the Factory and Workshop Acts: TIGHE, CHARLES, M.B., Ch.B. Aberd. (Eynsham, Oxford); WILSON, A. G., M.B. Lond. (Penistone, York).

HARLEY, HAROLD C., B.M. Oxf., has been appointed Casualty Medical Officer; R. S. BRUCE PEARSON, B.M. Oxf., and J. N. O'REILLY, B.M. Oxf., Out-patient Medical Registrars; J. F. L. KING, M.B. Lond., R. S. KIRK, M.B. Edin., and Miss ISABEL VALLANCE, M.R.C.S., Out-patient Anæsthetists; R. W. B. ELLIS, M.D. Camb., M.R.C.P. Lond., In-patient Medical Registrar; JAMES CROOKS, F.R.C.S. Eng., and J. K. WILLSON-PEPPER, M.B. Camb., Surgical Registrars, at the Hospital for Sick Children, Great Ormond-street, London, W.C.

PINEY, A., M.D., Ch.B. Birm., Assistant Physician, St. Mary's Hospital for Women and Children, Plaistow.

Vacancies

For further information refer to the advertisement columns

Accrington Victoria Hospital.—H.S. £150.
Association of Surgeons of Gt. Britain and Ireland, 65, Portland-place, W.—Surgical Scholarship.—£350.
Birmingham, Selly Oak Hospital.—Cas. O. At rate of £200.
Blackburn Royal Infirmary.—Fourth H.S. £150.
Bolingbroke Hospital, Wandsworth-common, S.W.—H.P. At rate of £120.
Bristol Eye Hospital.—Asst. Res. H.S. At rate of £100.
Bristol General Hospital.—Two H.P.'s, Two H.S.'s, &c. All at rate of £80.
Brook (Fever) Hospital, Shooter's-hill, S.E.—Res. Med. Supt. £1000.
Burnley, Victoria Hospital.—H.S. At rate of £150.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
Cardiff, Royal Hamadryad Seamen's Hospital.—Res. M.O. £650.
Central Histological Laboratory, Archway Hospital, Archway-road, N.—Histologist, Grade II. £750.
Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Res. H.S. At rate of £75.
Chesterfield and North Derbyshire Royal Hospital.—Cas. O. and H.S. At rate of £200 and £150 respectively.
Coventry and Warwickshire Hospital.—Res. Cas. O. £125.
Greenock Royal Infirmary, Renfrewshire.—Two H.S.'s. Each at rate of £100.
Guildford, Royal Surrey County Hospital.—Hon. Asst. Physician. Also H.S. £150.
Halifax, St. Luke's Hospital.—Consulting Surgeon. Four gns. per session. Also Jun. Res. M.O. £250.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. £50.
Hospital of St. John and St. Elizabeth, 60, Grove-End-road, N.W.—Res. H.P. At rate of £100.
Huddersfield Royal Infirmary.—H.S. At rate of £150.
Hull Royal Infirmary.—Cas. O. At rate of £150.
Infants' Hospital, Vincent-square, Westminster.—Med. Reg. £120.
Kingston-upon-Hull, Anlaby-road Institution.—Asst. M.O. £350.
Leamington Spa, Warneford General Hospital.—Res. Cas. H.S. and House Resident to Spec. Depts. £150.
L.C.C.—Consultant and Specialist Services.
Leeds University.—Medical Tutor and Registrar. £500.
Liverpool Heart Hospital.—Asst. Physician. £200.
Liverpool, Waterloo and District General Hospital.—H.S. £100.
London Homœopathic Hospital, Great Ormond-street, W.C.—Res. M.O. At rate of £100.
London Lock Hospital and Home, Harrow-road, W.—Hon. Surg.
Maidstone Kent County Mental Hospital.—Asst. M.O. £509.
Manchester, Ancoats Hospital.—H.P. At rate of £100.
Manchester, St. Mary's Hospitals.—Two H.S.'s, Whitworth-street West Hospital. Also Two H.S.'s, Whitworth-park Hospital. Each at rate of £50.
Mount Vernon Hospital, Northwood.—H.S. At rate of £150.
National Hospital for Diseases of the Nervous System, Queen-square, W.C.—H.P. £150.
Newcastle General Hospital.—H.S. and H.P. Each at rate of £150.
Nottingham City.—Asst. M.O.H. £500.
Nottingham General Hospital.—H.S. At rate of £150.
Oxford, Radcliffe Infirmary and County Hospital.—Hon. Surg. Also Hon. Surg. to Ear, Nose and Throat Dept.
Paddington Green Children's Hospital, W.—H.P. and H.S. Each at rate of £150.
Preston and County of Lancaster Royal Infirmary.—H.S. £150.
Putney Hospital, The Lower Common, S.W.—Res. M.O. At rate of £150.
Queen's Hospital for Children, Hackney-road, E.—Res. M.O. At rate of £200.
Royal Eye Hospital, St. George's-circus, S.E.—Hon. Physician.
Royal Northern Hospital, Holloway, N.—H.S., H.P., and Obstetric H.S. Each at rate of £70.
St. Mary Abbots Hospital, Marloes-road, Kensington, W.—Pathologist. £1100. Also Asst. Pathologist. £650.
St. Mary's Hospital for Women and Children, Plaistow, E.—Hon. Gynæcologist.
Salisbury General Infirmary.—H.P. At rate of £150.
Sheffield, Children's Hospital.—H.S. At rate of £100.
Sheffield Royal Infirmary.—H.S. Asst. Cas. O. and Asst. Aural and Ophth. H.S. Each at rate of £80.
Shrewsbury, Royal Salop Infirmary.—Res. H.P. At rate of £160.
Southampton, Royal South Hants and Southampton Hospital.—H.P., H.S. to Ear, Nose, and Throat Dept., and Res. Anæsthetist. Each at rate of £150.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.P. and H.S. Each at rate of £100.
West End Hospital for Nervous Diseases, 73, Welbeck-street, W.—Hon. Asst. Ophth. Surgeon.
West London Hospital, Hammersmith, W.—Hon. Med. Reg. to Children's Dept.
Wigan Royal Infirmary.—H.S. At rate of £150.
Winchester, Royal Hampshire County Hospital.—H.S. At rate of £125.
Windsor, King Edward VII. Hospital.—Res. M.O. £200.
Wolverhampton and Midland Counties Eye Infirmary.—H.S. £150.
Wolverhampton Royal Hospital.—H.S. At rate of £100.
York Dispensary.—Res. M.O. £175.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Troon, Ayr, and at Kirkcowan, Wigtown.

Births, Marriages, and Deaths

BIRTHS

CROWLEY.—On June 24th, at Dromquinna, Kenmare, the wife of Dr. J. F. Crowley, of a daughter.

EVERETT.—On June 20th, the wife of Alan D. Everett, F.R.C.S., of Montague House, Leatherhead, of a son.

HALLIWELL.—On June 20th, at Welbeck-street, the wife of A. C. Halliwell, F.R.C.S., of a daughter.

ORMEROD.—On June 24th, at St. Ronald, Broomhill-road, Woodford Green, the wife of Thomas Laurence Ormerod, M.B., of a son.

DEATHS

GOW.—On June 19th, at Porlock, William John Gow, M.D., F.R.C.P., aged 70 years.

JEANS.—On June 21st, suddenly, at Harrogate, Frank A. G. Jeans, M.A. Camb., F.R.C.S., of Rodney-street, Liverpool, aged 55.

ROBINSON.—On June 24th, at Greenhill-gate, Weymouth, John Elliott Robinson, M.B., D.P.H., County Medical Officer of Health of Dorset, aged 59.

SMITH.—On June 26th, at Salisbury, Sydney, Calvin Smith, M.R.C.S., L.R.C.P., D.P.H., &c., late of Atherstone, Muswell Hill, and Milford-on-Sea, aged 68.

WELCH.—On June 19th, at Knight's Hill Lodge, West Norwood, Samuel Welch, M.D., Citizen and Cutler, aged 82 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

ADDRESSES AND ORIGINAL ARTICLES

THE EFFICIENT TREATMENT OF PERNICIOUS ANÆMIA*

BY S. C. DYKE, D.M. OXF.
PATHOLOGIST TO THE ROYAL HOSPITAL, WOLVERHAMPTON
AND
EILEEN HARVEY, M.R.C.S. ENG.
ASSISTANT PATHOLOGIST AND MEDICAL REGISTRAR TO THE HOSPITAL

PERNICIOUS anæmia has now taken its place along with diabetes and myxœdema among the diseases due to deficiency of some principle normally present in the body, and the treatment of which depends upon substitution of the lacking substance. By the use of the anti-anæmic principle contained in liver it can be treated with a certainty of success such as holds in almost no other condition. There is now no reason why any sufferer from uncomplicated pernicious anæmia should not be restored to and maintained in a state of perfect health.

In order to attain this there are two essentials: (1) Correct diagnosis. (2) Appropriate dosage of the anti-anæmic principle.

Correct Diagnosis

Pernicious anæmia can readily be confused with other types of anæmia which will not respond to treatment with the anti-anæmic liver principle, though for some of them—e.g., the microcytic anæmias responsive to massive iron dosage—another satisfactory treatment now exists. Iron therapy is useless in the cure of pernicious anæmia, and, conversely, treatment by the active liver principle is of little use in the microcytic anæmias. Accurate diagnosis in any case of anæmia is then of prime importance. It is, however, impossible apart from the use of laboratory methods; even with the assistance of the laboratory it may not be easy. The diagnosis depends upon the combination of the results of a number of investigations; some of these results may be combined in different permutations, and all are seldom necessary. A questionnaire was recently circulated to the members of the Association of Clinical Pathologists on the measures essential for the establishment of the diagnosis of pernicious anæmia, and there was general agreement that a firm diagnosis could not be made without the use of all the following procedures:—

Estimation of the hæmoglobin percentage.
Enumeration of the red cells.
Examination of a stained film of blood.
Fractional test-meal.
Van den Bergh reaction of the serum.
Examination by some method of the variability in the size of the red cells.

It will be noted that it is impossible to make a firm diagnosis by the examination of the blood picture alone; the examination of the gastric contents for achlorhydria is also an essential step.

Dosage of Anti-anæmic Principle

It was laid down by G. R. Minot in the early days of the liver treatment that the effective dose of the anti-anæmic principle was roughly, and within wide limits, that contained in half a pound of liver daily. There are, however, few willing to go through life condemned to the ingestion of half a pound of liver a day, and to-day commercial preparations of the anti-anæmic principle have almost entirely replaced the use of whole liver. Originally these commercial preparations were intended entirely for oral use and were made up either from liver or hog's stomach; lately highly potent preparations of the anti-anæmic principle for parenteral injection have been made available.

These commercial preparations vary widely in price and it therefore becomes a matter of the greatest importance to determine in the first instance their effective dose, and in the second its cost.

In the liver preparations for oral use the effective dose may be expected to be that extracted from half a pound of liver; it does not necessarily follow that this is really an effective dose, as methods of extraction vary widely in the degree to which they permit of the recovery of the anti-anæmic principle. In the stomach preparations and of the liver preparations for parenteral injection even this guidance is absent; their effective dosage can only be determined by experiment.

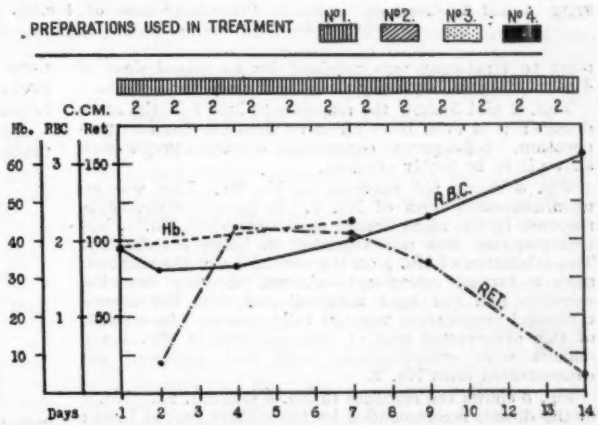


FIG. 1.—Response to treatment with No. 1 (doses of 2 c.cm. daily). Hb.=hæmoglobin per cent. R.B.C.=red blood cells in millions per c.mm. Ret.=reticulocytes per 1000 red cells.

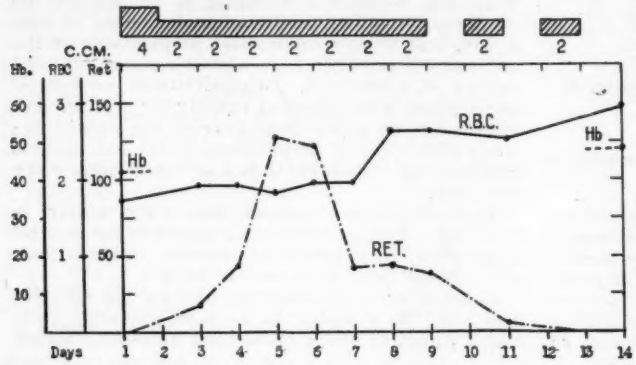
ASSAY OF PREPARATIONS FOR PARENTERAL INJECTION

An investigation was recently undertaken in the pathological department of the Royal Hospital, Wolverhampton, into the efficiency of certain preparations for parenteral injection. Owing to scarcity of subjects only four preparations were tested. Preparation No. 1 is of German origin, preparations No. 2 and No. 4 English, and preparation No. 3 American.

It is a recognised fact that in the successful treatment of pernicious anæmia actual increase of the circulating red cells is always preceded by a "reticulocyte crisis." Experience with No. 1 showed that, using it in effective dosage, the commencement of such a crisis was demonstrable by the second day of treatment and was at its maximum by the fifth. For the purposes of the investigation it was assumed that no preparation could be regarded as efficient which failed to show a definite increase of reticulocytes by the third day.

* Read before the Association of Clinical Pathologists at Manchester, June 24th, 1933.

Fig. 1 shows the reticulocyte response to No. 1. This preparation was early recognised as highly potent and was taken as standard. It was found that a satisfactory



FIGS. 2 and 3.—Response to No. 2. Preliminary dose of 4 c.cm. daily followed by doses of 2 c.cm.

start to treatment was obtained by an initial dose of 4 c.cm., followed by daily doses of 2 c.cm. for a week.

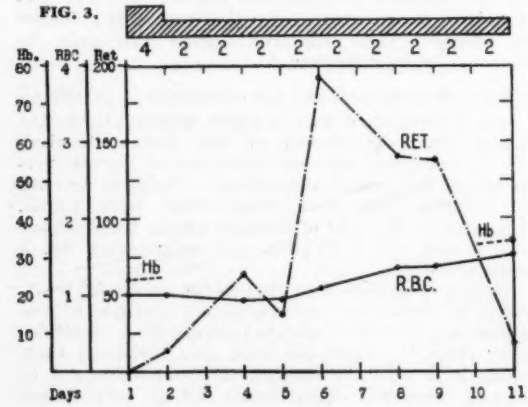
Figs. 2 and 3 show the response to No. 2 in the same dosage; it is even more effective than the German preparation. Subsequent experience of this preparation shows it to be highly efficient.

Fig. 4 shows the response to No. 2A. This was an unconcentrated form of No. 2. It gave a reticulocyte response in the same dosage as the standard No. 1, but this response was not regarded as being satisfactory. The exhibition of No. 1 on the conclusion of the response gave a further reticulocyte shower, showing that the response had not been maximal and that the unconcentrated preparation was not fully potent. As a result of this observation and of that recorded in Fig. 5 the makers were communicated with and produced the concentrated form No. 2.

Fig. 5 shows the response to No. 4 and No. 2A. No. 4 in the dosage recommended by the makers proved inert; No. 2A gave a slight response, but that in the dosage used it was not fully potent was shown by the subsequent response to No. 1.

Fig. 6 shows the response, or rather failure of it, to No. 3, an American preparation. This proved almost entirely inert; subsequent treatment with No. 1 gave a satisfactory response.

FIG. 3.



THE "FULL" DOSE

Of the preparations for parenteral injection 2 c.cm. of No. 1 or No. 2 may be regarded as the "full dose," using this term as described above in the sense of the daily dose required to give a maximal reticulocyte response. The "full" dose of oral preparations of the anti-anæmic liver principle has been taken as the equivalent of half a pound of liver. For the hog stomach preparations the "full" dose has been estimated from data supplied as the result of the questionnaire to members of the Association of Clinical Pathologists, and from personal experience.

Cost of Treatment

In attempting to gauge the cost of treatment with the various preparations, initial treatment has been considered to demand two "full" doses on the first day, and thereafter one "full" dose daily of all preparations, whether for oral or parenteral administration. For maintenance experience has shown that most patients, once their blood picture has been brought to normal, will carry on satisfactorily with one "full" dose weekly, of the preparations for parenteral administration; some require, for a time at any rate, only one such dose every two or even three weeks. Of the oral preparations experience has shown that most patients require one "full" dose at least three times a week.

On the above assumption an attempt has been made to estimate the average relative cost of one

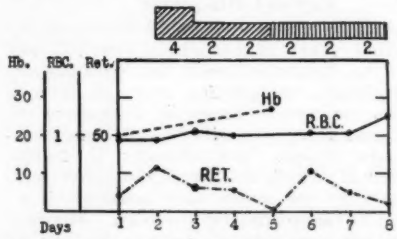


FIG. 4.—Response No. 2A, an unconcentrated form of No. 2, in doses of 4 and 2 c.cm. Subsequent reticulocyte response to No. 1.

week's initial treatment and of one week's maintenance on various preparations. The following figures were arrived at:—

TABLE I

	Week's initial treatment.	Week's maintenance treatment.
	s. d.	s. d.
Preparations for parenteral injection:—		
A. No. 1 above	8 8	1 1
B. No. 2 "	8 0	1 0
C.	48 0	8 0
Oral liver preparations:—		
A. Liquid	13 6	5 1
B. "	5 8	2 1½
C. Dry	24 0	9 0
D. Liquid	14 6	5 6
E. "	22 6	8 6
Oral stomach preparations:—		
A.	6 4½	2 1½
B.	42 0	15 9

It is evident from the above that both in maintenance and treatment efficient preparations for parenteral injection are much cheaper than those for oral administration; it is further evident that the cost per unit of bulk bears very little relationship to cost per unit of efficiency.

The Outlook for the Patient

Five years ago pernicious anæmia was an inevitably fatal disorder. It can now be treated with a certainty and accuracy such as prevails in the case of no other disease. That it is not so treated even now, Table II., compiled from the replies to a questionnaire sent out

to all patients treated for pernicious anæmia at hospital in the last five years, bears witness.

It shows the fate of 52 patients treated at the Royal Hospital, Wolverhampton, within the last five years.

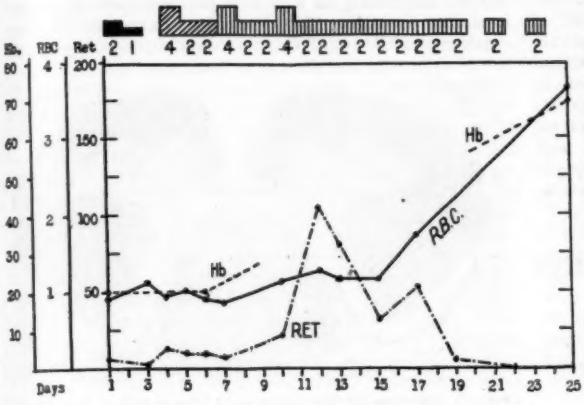


FIG. 5.—Response to Nos. 4, 2A, and 1.

Of these 19 attended regularly at the pathological department for examination of their blood picture, and reported on their state to their own doctors by whom the treatment was carried out. Of these 19

TABLE II

Total cases, 52.	Present state: Well.	In poor health.	Dead.	Lost.
Cases attending laboratory regularly (every week to every three months)—19 ..	19 ..	0 ..	0 ..	0
Cases not attending—33 ..	9 ..	7 ..	15 ..	2

all are now alive and well and able to carry on their business. One of them on admission was bedridden on account of paralysis of the legs due to degeneration of the cord, and one, a seamstress, had lost the use of her hands to such an extent that she was unable

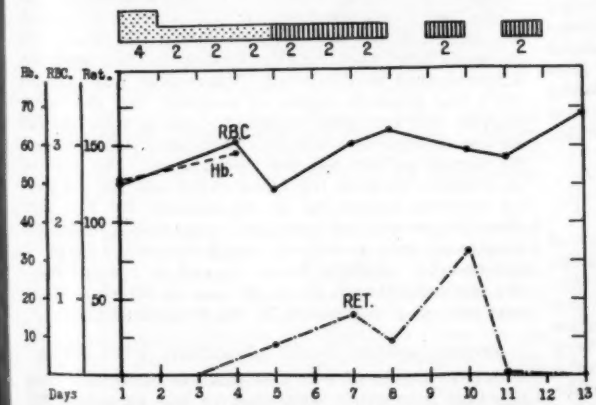


FIG. 6.—Failure of response with No. 3. Subsequent improvement with No. 1.

even to hold a needle; the first patient now does her housework unaided, and the second is again working as a seamstress.

Of the 33 patients who failed to turn up regularly for examination of their blood and a report for their doctor, only nine reported themselves as being in good health and able to carry on with their affairs; these, except one hero who reported himself as still devouring half a pound of liver daily, were all taking an efficient dose of some commercial preparation under the direction of their own doctors; of the remainder, seven were in such poor health that they were unable to attend to their affairs; and 15 were dead. Two were not traced.

Of the dead it should be pointed out that three died of carcinoma of the stomach, the presence of which was confirmed in each case at post-mortem. This high incidence of carcinoma of the stomach is, to the best of our knowledge, a hitherto unreported phenomenon. It may have something to do with the current superstition that carcinoma of the stomach may give the blood picture of pernicious anæmia.

Leaving aside the deaths from carcinoma, the remainder are directly attributable to pernicious anæmia. There is no reasonable doubt that had these patients been properly treated all would now be alive and well; further, those who reported themselves as being in ill-health and unable to follow their affairs might be about their own and the world's business.

Need for Anti-anæmic Service

The above Table serves to show the necessity for a close supervision of all cases of pernicious anæmia, even after the blood picture has been restored to normal. Relapse is so insidious that its progress is not noticed by the patient until matters have progressed far, perhaps too far for further successful treatment. Further, in the relapsed case, even after many weeks of treatment, though it may be possible to restore the blood picture to normal, the damage to the central nervous system may be irremediable.

It is essential that every patient suffering from pernicious anæmia should attend the laboratory at intervals of from one to three months, according to his or her condition, for examination of the blood and adjustment, if necessary, of the dosage of the anti-anæmic principle. In no other way can maintenance in a satisfactory state of health without unnecessarily heavy dosage be guaranteed. If this routine is followed there is no reason why any ordinary patient with pernicious anæmia should not be maintained in a good state of health.

At the present time, through the National Health Insurance service, a certain amount of money is spent on the commercial preparations of the anti-anæmic principle. As shown in Table I. the effective dose of these preparations varies widely in price; it is probable that of the preparations prescribed a good many are administered to patients not suffering from pernicious anæmia at all, to whom they will be valueless. It is certain that of those prescribed to patients suffering from pernicious anæmia they are in many instances given in such dosage as to be ineffective.

It would appear desirable that some official guidance should be given to panel practitioners as to the efficiency and dosage of the anti-anæmic principle; it is absurd that the country should be paying 15s. for a dose of the principle that might be obtained in the shape of another preparation for 1s.

It further appears desirable that there should exist some machinery available to the general practitioners

of the country to aid them first in identifying cases of pernicious anæmia, and afterwards keeping a watch upon the blood picture. This is only a further instance of the necessity for including laboratory service within the N.H.I. benefit, but it is a particularly striking one; there can be little doubt but that its absence is responsible for a good deal of wastage through unnecessary ill-health and avoidable death. The diagnosis and treatment of panel patients suffering from pernicious anæmia is at present in the main carried out in the voluntary hospitals throughout the country; and the voluntary hospitals would appear to constitute the most suitable and satisfactory centres for the working of such an anti-anæmia service in association with the N.H.I. system.

SUBACUTE COMBINED DEGENERATION AND PERNICIOUS ANÆMIA*

BY J. G. GREENFIELD, M.D. EDIN., F.R.C.P. LOND.
PATHOLOGIST TO THE NATIONAL HOSPITAL, QUEEN-SQUARE

AND

ELIZABETH O'FLYNN, M.R.C.P. LOND.
PATHOLOGIST TO QUEEN'S HOSPITAL FOR CHILDREN, HACKNEY-ROAD; LATE ASSISTANT PATHOLOGIST TO THE NATIONAL HOSPITAL

THIS paper is an attempt to answer certain questions on the relationship of subacute combined degeneration of the cord to pernicious anæmia. It is generally accepted at the present time that this relationship is an intimate one, and Ahrens[1] has even suggested that every case of pernicious anæmia would probably at some time show evidence of combined degeneration of the spinal cord. But it is equally evident that the anæmia does not of itself produce disease in the cord, as there is no necessary relationship between the degree of anæmia and the appearance or progress of nervous symptoms.

As a basis for this investigation we have analysed our records of pathological examinations made in cases admitted to the National Hospital, Queen-square, during the years 1929 to 1932. These years were chosen because by the beginning of 1929 routine investigation and treatment of cases of suspected combined degeneration of the cord on modern lines had been instituted. During these years we found 45 cases in which the final clinical diagnosis was that of subacute combined degeneration, and of which full laboratory investigations had been made.

ACHYLIA GASTRICA IN SUBACUTE COMBINED DEGENERATION

While the total acidity and the percentage of chlorides in the gastric juice may show significant changes in cases of this kind, the most important examination is that for free HCl. In our cases this was always *completely absent on the first examination* of the gastric juice. In one patient there was a very slight response of HCl to histamine injection on a second examination which was made after 16 months of regular liver treatment. This contrasted with a case of microcytic anæmia with asymmetrical nervous symptoms in which, although no free HCl was present in the samples of gastric juice drawn off during the first hour, a brisk secretion of acid followed injection of histamine.

* Read at the meeting of the Association of Clinical Pathologists in Manchester on June 24th, 1933.

While A. F. Hurst's demonstration of achylia gastrica in cases of pernicious anæmia and subacute combined degeneration has been repeatedly confirmed, there has also been evidence that this sign is not constant in either disease. It was therefore rather surprising to find it constantly present in our series of 45 cases. No doubt in a larger series cases with free HCl would form a definite percentage; but

FIG. 1.—Section of the spinal cord from a patient who died of lobar pneumonia eight months after symptoms of subacute combined degeneration had appeared. The lesions are very slight and are confined to the central part of the dorsal columns.

it appears to be true that achylia gastrica is at least as constant in subacute combined degeneration as in Addison's anæmia.

THE BLOOD COUNT IN SUBACUTE COMBINED DEGENERATION

The state of the blood, when the patients came under treatment, varied from 1½ million red cells per c.mm. with 58 per cent. Hb., to normal counts. Of our 45 cases, 6 had less than 2 million red cells, 8 between 2 and 3 million, 20 between 3 and 4 million, 5 between 4 and 4½ million, and 6 over 4½ million red cells. Thus in almost half our cases the red cell count lay between 3 and 4 million, and in a quarter was above this level. The colour-index was high in all, varying from 0·9 to 1·6, and in all except two cases it was on at least one occasion above 1. In these two cases the first red cell count was normal, 5½ million in one and 4·85 million in the other. As is usual the colour-index tended to fall with an improvement in the blood picture and was highest with the greatest degree of anæmia, but the latter feature was not quite constant. Along with the fall in the colour-index the halometric readings returned to normal as the red cell count rose. The lack of co-relation between the blood count and the progress of nervous symptoms is emphasised by the fact that 14 per cent. of our cases came into hospital for treatment with a red cell count over 4½ millions, a colour-index slightly below 1, and a normal halo. On the other hand, in every case in which anæmia was present it conformed to the pernicious type.

SPINAL LESIONS UNDER TREATMENT WITH LIVER

A comparison of our post-mortem material during the last four years with that in the preceding ten years has revealed a fact on which little stress has been laid in the literature, although it was pointed out by Michell Clarke in 1904.[2] This is that in the early stages and in stages of remission of nervous symptoms the lesions are often confined to the dorsal columns of the cord. Michell Clarke observed this in cases dying of an intercurrent disease during the course of pernicious anæmia. None of the

20 cases on which post-mortem examinations were made in this hospital in the ten years prior to 1909 showed this limitation of the lesions, but it was found in three of the nine cases which have been examined since this date (Fig. 1), and in another only the slightest evidence of degeneration of the lateral columns was present. It has not been unusual in our material to find that the lesion in the posterior columns antedates that in the antero-lateral columns by many months, as judged by the stage of myelin destruction and by the degree of gliosis. This agrees with the common clinical history that sensations of numbness and tingling with some ataxia and loss of vibratory sense may antedate by a year or more symptoms of pyramidal tract degeneration. This sequence of lesions in the spinal cord was noticed in our older material as well as in that of recent date, and apparently bears no relation to modern methods of treatment. The only effect of treatment by liver may be to arrest the disease before it has attacked the lateral columns, so that if the patient dies of an intercurrent disease a pure posterior column degeneration will be found.

It is interesting that in one of our cases a bilateral Babinski response was present, although the lesions in the lateral columns were extremely slight, only one or two vacuoles being present in each section. Evidently therefore the Babinski response antedates definite visible changes in the pyramidal tract, a fact which may explain the occasional disappearance of this sign in the early stages of the disease. This localisation of the early lesions suggests that disease of the spinal cord may be present before any neurological signs can be elicited except diminution of vibratory sense and of joint sense; and it lends support to the view that the subjective sensory symptoms of pernicious anæmia are due to disease

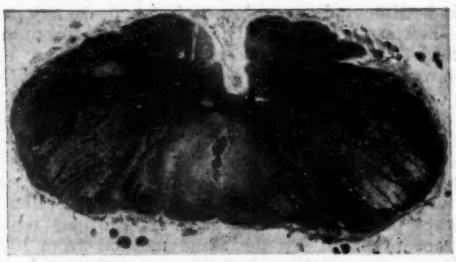


FIG. 2.—Section of the spinal cord from a patient who had had numbness and clumsiness of the hands and feet for 18 months, but was still able to play golf five weeks before death. There is an old-standing sclerosis in the centre of the posterior columns with recent acute lesions in the antero-lateral columns.

of the spinal cord. It seems, however, certain that in some of these cases the chief or perhaps the only anatomical basis of the symptoms is peripheral neuritis. This was suggested by Russell, Batten, and Collier[3] in their classic paper, and has more recently been confirmed by Mathieu.[4] But we do not yet know whether peripheral neuritis is an integral part of the syndrome of subacute combined degeneration, or whether its presence in certain cases is purely fortuitous. Nonne[5] held that it played no part in the syndrome, and the fact that very few workers have demonstrated lesions of the peripheral nerves in pernicious anæmia supports his contention. Woltmann[6] found clinical evidence of peripheral neuritis in 4·9 per cent. of 120 cases of pernicious anæmia with nervous symptoms, and suggested that the absence of pathological corroboration of these figures may be due to incomplete examination of post-mortem material. Unfortunately the relative ease and rapidity with which recovery takes place in the peripheral nervous system will make this problem even more insoluble in the future than it has been in the past.

The treatment of subacute combined degeneration is certainly more difficult than that of pernicious anæmia. We do not yet know with certainty whether every proved remedy for the latter disease is capable of curing the nervous lesions. This doubt is suggested by the statement recently made by Prof. Davidson[7] that subacute combined degeneration appeared in patients who are relying on liver and stomach extracts and who take little or no liver. Ungley[8] has adduced evidence that a diet of brain, which is insufficient to keep the blood count steady, may nevertheless produce marked improvement in the nervous symptoms. The available evidence goes to show that much larger doses of liver are needed to abolish nervous symptoms than to raise the blood count to normal, but the numerous cures that have taken place under this régime are an encouragement to further endeavours.

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THE TREATMENT OF ANÆMIAS*

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LOGICAL treatment of the anæmias is dependent upon a knowledge of the factors causing anæmia. A classification of anæmias upon an ætiological basis, though at present such a classification can only be temporary, is clearly of more value to the clinician than one dependent upon morphological features. Anæmias may be due to disordered production of red cells or hæmoglobin, the dyshæmopoietic anæmias, to excessive loss of blood, the post-hæmorrhagic anæmias, to excessive destruction of blood in vivo, the hæmolytic anæmias. The dyshæmopoietic anæmias are caused by (1) a deficiency of one or more of the factors essential for hæmopoiesis; (2) to the presence of factors disturbing hæmopoiesis; (3) to exhaustion following over-stimulation of hæmopoietic tissue. Deficiency of essential factors may also play a part in post-hæmorrhagic anæmias, especially those where blood loss has become chronic. The anæmias dependent upon a known deficiency of essential factors can obviously be most satisfactorily treated. In treating the deficiency anæmias it is necessary to determine first which essential factor is lacking, and secondly by which methods this deficiency should be made good.

Hæmopoietic Principles

The known hæmopoietic principles are:—

(1) A factor in liver effective in Addisonian

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pernicious anæmia, which for the sake of briefness may be called the P.A. factor.

(2) A factor in liver effective in hypochromic anæmia.

(3) Iron.

(4) Copper.

(5) Vitamin C.

(6) Thyroxine.

Roughly speaking hyperchromic anæmias—i.e., anæmias with a high colour-index where stroma is more affected than hæmoglobin—are due to a deficiency of the P.A. factor. Hypochromic anæmias—i.e., anæmias with a low colour-index where hæmoglobin is more affected than stroma—are due to a deficiency of iron. Hæmoglobin content is a surer guide to treatment than red cell size. Addisonian pernicious anæmia gives a megalocytic Price-Jones curve and responds to liver or its substitutes. Erythroblastic anæmia associated with idiopathic steatorrhœa may likewise give a megalocytic curve with a high degree of variability, but is relieved by iron. In the former there is a high colour-index, in the latter an extremely low one. Therefore, for all practical purposes anæmia with a high colour-index, until the contrary is proved, may be considered due to lack of the P.A. factor.

THE P.A. FACTOR

The P.A. factor was originally thought to be formed by the action of a factor present in normal gastric juice, the intrinsic factor, upon an extrinsic factor present in the food digested. Certain American observers claim to have obtained satisfactory remissions by the injection of gastric juice alone. Their work awaits confirmation. If the original hypothesis proves correct a deficiency of the P.A. factor may theoretically be due to lack of extrinsic factor, owing to a deficient diet, to lack of intrinsic factor, owing to complete or partial failure of gastric secretion, or to failure of absorption of the completed product.

The question at once, therefore, arises as to how far it is possible to determine which type of defect is present. Clinical trial will alone answer this question. There is at present considerable divergence of opinion, based upon conflicting experimental results, as to whether there is ever a lack of extrinsic factor only. It was originally suggested that certain megalocytic hyperchromic anæmias that responded to marmite were due to lack of extrinsic factor which was supplied by marmite. This may prove to be true. On the other hand, if sufficiently large quantities of marmite are given to undoubted cases of Addisonian pernicious anæmia, they may induce a typical response which suggests that possibly marmite may contain the fully formed P.A. factor. At present it is impossible to be dogmatic on this point. It is, however, clear that marmite provides a definite hæmopoietic factor which is not vitamin B, which is thermostabile, soluble in 80 per cent. alcohol, and not present in all yeast preparations. It is possibly some protein breakdown product. Apart from theoretical considerations as to the nature of this factor, it is a point of some practical importance to know how far marmite should be used in treating hyperchromic anæmias, since it is far less expensive than liver or stomach. When a patient is not desperately ill and it is possible to make repeated reticulocyte counts, marmite should be given by mouth for two weeks. If the reticulocyte count does not show the calculated maximum rise, liver or its substitutes should be given by mouth for two weeks. Again, if there is no adequate reticulocyte response, parenteral therapy must be instituted. The effect should again be checked by reticulocyte counts. If there is no appreciable reticulocyte rise within a further two weeks, although full doses were given, an effective extract was used and none of the inhibitory factors was present, then it is clear that the anæmia though simulating that due to a deficiency of the P.A. factor must have some other cause. There is no evidence at present available that prolonged treatment will produce a beneficent effect on the blood picture when initial treatment has failed.

Such a method of assay enables us to determine at least to some extent the nature of the deficiency present, and since accurate knowledge of the ætiology of any clinical condition to be treated is of value, is the ideal method. Having analysed the deficiency as far as possible, it is then legitimate to use parenteral therapy if it is preferred. Immediate parenteral therapy is only indicated when the patient is in extremis. Probably when the total red cell count is under 1,000,000 per c.mm. intravenous or intramuscular preparations should be given. In the presence of severe sepsis they may also be indicated. Their value in maintenance is discussed later.

Marmite may safely be given indefinitely to those anæmias that respond satisfactorily. Has whole liver any advantage over liver or stomach extracts? It clearly has the disadvantage of being extremely unpalatable when taken every day for a long period. Some observers believe that it is more satisfactory in the treatment of nervous lesions than any extract. In severe cases of subacute combined degeneration, therefore, the patient, if willing, should take whole liver or kidneys as far as possible, supplemented with extracts. Satisfactory stomach preparations are as reliable as liver preparations.

DOSAGE

It is difficult if not criminal to lay down any hard-and-fast rules concerning dosage. The response in different people is extremely variable, and each case must be judged upon its merits. In preparations for oral administration some patients require extract made from 3 lb. of liver a day, while others respond satisfactorily to similar extract from ½ lb. of liver. There is the same variability in the response to parenteral administration. Some patients will show a maximum response following the injection of extract prepared from 20 g. of liver, others require extract prepared by the same method from 100 g. of liver. The position is further complicated by the fact that extracts vary enormously in potency. This is in part due to differences in methods of preparation and in part to unknown factors. Even if two batches of extract are prepared by the same process, one may be active and the other not. No satisfactory indication is at present available as to the actual potency of any extract on the market. The majority are stated to be equivalent to so much fresh liver, which merely represents the amount used in their preparation. This is misleading since potency is always lost during extraction. An extract made from 6 g. of liver may be far more potent than one from 100 g. of liver. In actual treatment two questions arise: (1) What is the initial dose required to return the blood picture to normal? (2) What is the maintenance dose required to maintain this normal blood picture?

Initial Dose.—Three drachms of marmite, or half a pound of fresh liver or extract made from one pound of fresh liver should be regarded as a minimum daily initial dose if the P.A. factor is to be given by mouth. It is probably wiser to start with one pound of fresh

liver a day, which can be decreased later. In the case of parenteral administration I give for the first week at least one, and preferably two, ampoules of Campolon daily—i.e., an extract prepared from 10 g. of fresh liver, and I am guided in further treatment by the clinical and hæmatological response. If this is satisfactory I reduce the dose to one ampoule every other day, and then to one ampoule once or twice a week.

Maintenance Dose.—Parenteral therapy is probably the cheapest and most efficient method of maintenance treatment. One ampoule of campolon once a week is usually sufficient to maintain a satisfactory blood picture. Until we know more of the body's ability to store the P.A. factor it seems wiser to give small doses frequently than larger doses at long intervals, though in case of necessity such a method appears efficient. It is possible by giving four ampoules of campolon at a single injection to obviate the necessity of treatment more than once in six weeks in some patients. Whether this is the ideal method remains to be proved. If extracts are given by mouth it is usually necessary to give extract made from at least half a pound of liver daily.

Indications for both an increased initial and maintenance dose are: (1) the presence of sepsis; (2) arterio-sclerosis as evidenced by raised blood pressure and thickened vessels; (3) cord lesions. This is especially true in the latter. It has been clearly shown that though the half pound of liver may be adequate to maintain a satisfactory blood picture, amelioration of nervous signs and symptoms only occurs when such a dose is doubled or trebled. All patients with Addisonian pernicious anæmia should be treated as potential cases of subacute combined degeneration of the cord and, therefore, given rather more of the P.A. factor than is sufficient to maintain a red cell count above 4,500,000 per c.mm. Patients with hyperchromic anæmia associated with sprue usually need no further therapy after recovery from the anæmia and other symptoms is once complete. Patients with pernicious anæmia of pregnancy, as distinct from Addisonian pernicious anæmia, developing during pregnancy, after delivery and initial cure of the anæmia do not relapse on cessation of treatment. Patients with Addisonian pernicious anæmia and with megalocytic hyperchromic anæmia associated with idiopathic steatorrhœa must take liver or its substitutes indefinitely.

HYPOCHROMIC ANÆMIA FACTOR

There is relatively little evidence as to the value of the hypochromic anæmia factor in liver isolated by G. H. Whipple and his co-workers. Whipple's most recent experimental work suggests that the liver contains factors essential for hæmoglobin regeneration independent of its content of iron and of the P.A. principle. Clinical corroboration of these experiments is not altogether satisfactory. Hypochromic anæmia in which adequate tests have been made appear to respond at least as well if not better to iron than to this factor.

IRON

The essential characteristic of anæmias that respond to iron is a diminution of hæmoglobin. It is rational to treat all anæmias with a low colour-index with large doses of iron. The red cells may be microcytic, they may be normocytic, or they may be megalocytic. The response to iron is clear-cut in all. Deficiency of iron may be due to defective intake, defective gastric secretion, or defective absorption. In the infant deficient storage in the liver during intra-uterine life appears to play a definite part. Roughly speaking, the only hypochromic anæmias that fail to respond to iron therapy are anæmias associated with sepsis or nephritis, splenic anæmia, acholuric jaundice, and anæmias not necessarily of the myelopthysic type associated with secondary carcinoma in the skeletal system. The presence of cancer alone does not inhibit the action of iron. I have seen a reticulocyte response as high as 15 per cent. in a patient with inoperable carcinoma of the rectum and a corresponding improvement in total red cell count, hæmoglobin, and clinical condition.

As in the case of the P.A. factor it is essential to give enough iron. The dangers of overdosage with oral administration are slight. Both in infants and adults ferrous salts appear more effective than ferric salts. The minimum effective dose of pil. ferri in an adult is 45 grains a day. The minimum dose of iron and ammonium citrate is 60 grains a day. Personally I always give 90 grains a day as an initial dose, and then reduce it. Patients with hypochromic microcytic anæmia of long standing are often rather difficult, and further treatment is rendered much easier if the initial response is dramatic. Certain refractory cases require even higher doses—350 grains of iron and ammonium citrate have been given daily over long periods without mishap. Many cases of idiopathic microcytic anæmia are complicated by menorrhagia. The anæmia is almost invariably primary. Adequate iron therapy will cure both conditions, a fact which was apparently recognised at the beginning of the last century and then forgotten. In a few instances it is necessary to induce an artificial menopause. This should not be done, however, until iron has been given an adequate trial. Recent gastric operation or gastric hæmorrhage is no contra-indication to the administration of large doses of iron. Iron therapy should be a routine post-operative and post-hæmorrhage treatment in all gastric cases. Just as a deficiency of the P.A. factor is permanent, so is deficiency of iron in many patients. Controlled and continuous treatment is essential both in idiopathic microcytic anæmia and in post-operative gastric cases. Certain patients with Addisonian pernicious anæmia, especially in the maintenance period of treatment, are also benefited by the administration of iron. Such patients usually show a low hæmoglobin value and achromic cells in stained films.

COPPER

It has been maintained that copper should be added to iron if the best results are to be obtained. Copper may be a toxic agent. It is unnecessary to prescribe it, as is often done, before it is known that iron alone is ineffective. If a patient fails to respond to adequate doses of iron it is then reasonable to try the addition of copper.

VITAMIN C

Vitamin C appears to exert a specific effect upon the anæmia of scurvy. The mechanism of its action is not understood. Since rather atypical forms of adult scurvy are probably more common than is realised, plentiful supplies of vitamin C should be given to all patients with hypochromic anæmia of unknown ætiology.

THYROXINE

The part played by the thyroid in hæmopoiesis is still undetermined. Hypochromic anæmia and megalocytic hyperchromic anæmia may be associated with myxœdema. In both types of anæmia, if a satisfactory response to appropriate therapy is not obtained, the possibility of an additional thyroid deficiency should not be forgotten. Thyroid medication in many cases will complete the cure.

An adequate and well-balanced diet forms an essential part in the treatment of all anæmias—i.e., a diet containing fresh red meat, green vegetables, fresh fruit, milk, and butter.

Transfusion

Hæmopoietic substances are often given to other anæmias than those dependent upon a deficiency of such factors. There is no evidence that they are of any value, and they are often only an unjustified expense. Such anæmias may be benefited by blood transfusions. Transfused blood may apparently act in two ways. It may supply sufficient blood to enable the patient to carry on for a week or fortnight but then has to be repeated as in aplastic anæmia. Transfusion also appears in some instances to stimulate hæmopoiesis. At present it is impossible to predict when this will occur. Provided adequate steps are taken to transfuse compatible blood there are, I believe, no contra-indications to transfusion. I have seen many patients benefited, and only one instance in which transfusion could possibly be said to have shortened life. It is always worthy of trial in anæmias which fail to respond to other treatment. Direct matching of the blood is essential, especially in patients who have been frequently transfused.

Splenectomy

The value of splenectomy in anæmia is as controversial as that of transfusion. It is of undoubted value in acholuric jaundice, and gives at least temporary relief in idiopathic purpura. Its value in early cases of splenic anæmia is less certain. In a certain proportion of patients it appears to cause amelioration of symptoms. Splenectomy should not be attempted until iron therapy has failed. Idiopathic microcytic anæmia may simulate splenic anæmia. The one responds to iron the other does not. This affords an excellent example of the value of carefully controlled treatment in the diagnosis of anæmias.

A VIRUS OBTAINED FROM INFLUENZA PATIENTS

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THE epidemic of influenza at the beginning of 1933 afforded an opportunity of making an experimental study of this disease, the results of which are here embodied in a preliminary communication. Throat-washings were obtained from a number of patients as early as possible after the onset of definite symptoms. On the assumption that the ætiological agent of influenza was probably a filtrable virus the throat-washings were filtered before use through a membrane impermeable to bacteria. The filtrates, proved to be bacteriologically sterile, were used in attempts to infect many different species. All such attempts were entirely unsuccessful until the ferret was used and the first success was only secured towards the close of the epidemic.

The initial successful experiment was made with two ferrets, both of which received a filtrate of human throat-washings, both subcutaneously and by intranasal instillation. Both animals became obviously ill on the third day after infection and exhibited symptoms of the characteristic disease which is described below. It was found that the disease could be transmitted either by contact or by direct transference of nasal washings from a sick to a healthy ferret. At this point therefore the work was transferred to the Institute's farm laboratories at Mill Hill, where it could be carried out under the conditions of rigid isolation of individual experimental animals evolved and used by Dunkin and Laidlaw[1] in their work on dog distemper * (1926).

The Disease in Ferrets

The ferret disease is characterised by a two-day incubation period, a diphasic temperature response, symptoms of nasal catarrh and variable systemic disturbances. In the infected animal the temperature† rises abruptly about 48 hours after infection, often exceeding 105° F. or even 106° F. It subsides on the third or fourth day only to rise again on the fourth or fifth day. In the course of the next day or two the temperature gradually returns to normal, and in most cases remains thereafter within normal limits.

Coincidently with the primary rise of temperature the ferret looks ill, is quiet and lethargic, often refuses food, and may show signs of muscular weakness. The catarrhal symptoms usually begin on the third day. The eyes become watery and there is a variable amount of watery discharge from the nose. This nasal discharge at times becomes sticky and may be mucopurulent, thus causing matting of the fur along the edges and at the corners of the nostrils. The animal sneezes frequently, yawns repeatedly, and in many cases breathes partly through the mouth with wheezy or stertorous sounds which clearly indicate a considerable degree of nasal obstruction. Such obstruction rarely accompanies a copious nasal discharge. The tip of the nose is often very pale. The signs of illness may last for only a few days but sometimes continue for ten days, after which the ferret again becomes perfectly normal. There is considerable variation as regards both the temperature response and the intensity and time of appearance of the local symptoms. In a few ferrets a typical diphasic temperature response has occurred without any nasal symptoms, and in one case well-marked symptoms were noted without any elevation of temperature. These animals when tested later were found to be immune. Very occasionally a ferret, a short time after recovery, has had a relapse in which the temperature curve and the symptoms have been similar to those of the primary illness. The disease has never been fatal in the 64 cases observed throughout the full course of the illness. Fig. 1 illustrates the temperature response of a ferret which had a typical attack of the disease, with a relapse.

In ferrets killed during the first and second febrile periods the mucous membrane of the nasal passages shows acute inflammation. Sections across the turbinate bones show, in the soft parts, acute vascular congestion, dilated lymph channels, numerous leucocytes passing out through the epithelium, and serious

* It is essential, when employing ferrets as experimental animals, that all purchased animals be quarantined for 14 days before being brought into use. If this precaution be omitted it is probable that latent distemper infection will, sooner or later, give rise to serious confusion. There is another acute infectious disorder, the ætiology of which is still obscure, which may also give untold worry to the research worker. Neck abscesses may develop in older animals and examination for these is essential if error is to be avoided.

† The normal temperature of a ferret is somewhat variable but it is unusual in a quiet animal to record a reading of over 103·5° F.

derangement of this structure. There is almost invariably complete disappearance of ciliated cells, and occasionally patchy necrosis of the whole thickness of the epithelium may be observed. No histological feature, such as an inclusion body, has as yet been discovered which can be called characteristic of the disease.

Passage of the Virus

The disease has frequently been transmitted by placing a normal ferret in the same cage as a sick one for 24 hours. The majority of virus passages, however, have been made by the following technique.

The infected animal is killed when showing symptoms, often at the beginning of the second temperature rise. The turbinates are scraped out, ground up with sand, and emulsified in about 20 c.cm. of equal parts of broth and saline. The emulsion is lightly centrifuged, and about 1 c.cm. of the supernatant fluid is dropped into the nostrils of another ferret. In this way 26 serial passages of one strain of virus have been made, and every animal of the series has shown the typical temperature response together with definite symptoms of the disease. A hundredfold dilution of the usual preparation has also been found to be regularly infective.

The method we are forced to employ has the serious disadvantage that it is impossible to make accurate quantitative experiments. The concentration of virus in the emulsion is unknown and it is impossible to determine what proportion of the amount instilled into the nose is retained, but no other route of inoculation has yet proved successful and other tissues tested—e.g., spleen, lymph glands, and blood—have been uniformly non-infective.

Throat-washings from eight human cases diagnosed as influenza have been inoculated into ferrets; five of these produced the ferret disease described above, although four were tested before the importance of utilising temperature records was recognised. From one of these cases throat-washings on the first and second day, and nasal discharge on the third day, were infective for ferrets, but on the sixth day no virus was recoverable from the nasal discharge, and on this day there was considerable improvement in the patient's catarrhal symptoms. A filtrate prepared from an emulsion of lung tissue from a fatal case of influenzal pneumonia likewise produced the ferret disease.

Throat-washings from four human subjects not suffering from influenza were non-infective. Of these, two were taken from men who had recovered from influenza and who at the time of their illness had supplied washings which were the genesis of the transmissible strains of virus with which we have done most work.

The nasal secretions of a man who was suffering from a severe common cold were also non-infective.

Filtrability of the Virus

Most of the human throat washings were filtered before use through membranes having an average pore size of 0·6 μ. The membranes were Gradocol membranes made and supplied by Mr. W. J. Elford, Ph.D.[2] (1931), to whom we are greatly indebted. The filtrability of the virus after ferret passage was tested repeatedly. Invariably filtrates of an emulsion of the nasal mucosa from a sick ferret through membranes having an average pore size of 0·6 μ were found to produce the typical disease. A tight membrane (a.p.s. 0·25 μ) was used on one occasion only; the resultant filtrate was infective. It is probable therefore that the virus of ferret influenza is no larger than the viruses of vaccinia or herpes febrilis.

The infectivity of the filtrates, coupled with the fact that we failed to grow anything from the filtrate on a variety of media under aerobic or anaerobic conditions, has convinced us that we are dealing with a true virus disease. We have examined a number of bacteria from ferrets and human beings and so far we have failed to discover any micro-organism which will mimic the disease when cultures are instilled into a ferret's nose. *Hæmophilus influenzæ*, *Hæmophilus canis*, and *Hæmophilus influenzæ* (*suis*) administered along with virus produced at most only minor variations in symptoms.

Active Immunity

Ferrets which have recovered from the disease are invariably found to be immune to subsequent infection with the same strain of virus. This holds true whether the immunity test is done a few days after the disappearance of symptoms or five or six weeks later. One of two ferrets tested after the lapse of three months proved to be solidly immune and the other had a very mild attack of the disease with prompt recovery. At the present time it remains uncertain whether viruses from different human sources cross-immunise completely. No means of securing an active immunity apart from giving the disease itself have yet been found.

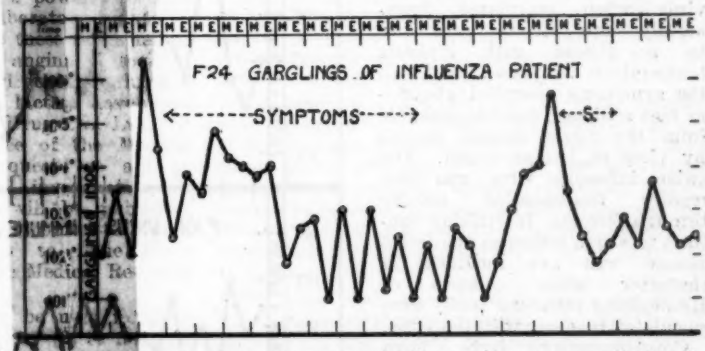

FIG. 1.—Temperature chart of ferret infected with garglings from a patient. The relapse is very unusual.

Virus Neutralisation

The serum of a ferret which has recovered from the disease will neutralise strong emulsions of the virus, provided that the serum and virus are mixed together before being inoculated intranasally into the test animal. Normal ferret serum has no such power of virus neutralisation, even when dilute virus is used in the test. Fig. 2 illustrates a virus neutralisation experiment.

Many human sera are capable of neutralising dilute ferret virus. Sera obtained from ten patients after their recovery from influenza were all found to have neutralising antibodies, but their demonstration was not constant, for two of the sera when retested failed to protect the experimental animals. Such irregularity is probably due to our inability to measure the dosage of virus employed, and it is quite possible,

under the conditions of the only test at present available, that an overwhelming dose of virus is given in one case and not in another. Control ferrets inoculated with virus alone or with virus mixed with normal serum were always included in these neutralisation tests; they invariably developed the disease.

Three human sera from individuals with no history of a recent attack of influenza were also tested: one showed neutralising properties; the other two were inactive. Such a result would be expected in tests on a population shortly after an epidemic of influenza.

Relationship to Swine Influenza Virus

A disease of swine, which arose spontaneously at the time of an influenza epidemic in America, has been described by Shope [3] (1931, 1932). We are indebted to him for samples of the swine influenza virus, and also for cultures of *Hæmophilus influenzæ* (*suis*), an organism which plays an important rôle in the serious and fatal cases of the swine disease. The virus when inoculated intranasally into ferrets gave rise to a disease with diphasic temperature response, and all the symptoms described above—in fact a disease indistinguishable from the ferret disease caused by virus of human origin. The swine influenza virus was also readily transmissible serially through ferrets. In striking contrast to swine influenza the ferret disease was not modified in character when cultures of *Hæmophilus influenzæ* (*suis*) were inoculated together with the virus.

Cross-immunity tests have shown that this swine influenza virus bears a close antigenic relationship to the virus strain of human origin which has been chiefly used in our work. Ferrets after recovery from disease caused by the swine virus proved to be solidly immune to the human strain of virus. Ferrets convalescent from the human virus disease were not completely immune to the pig strain of virus.

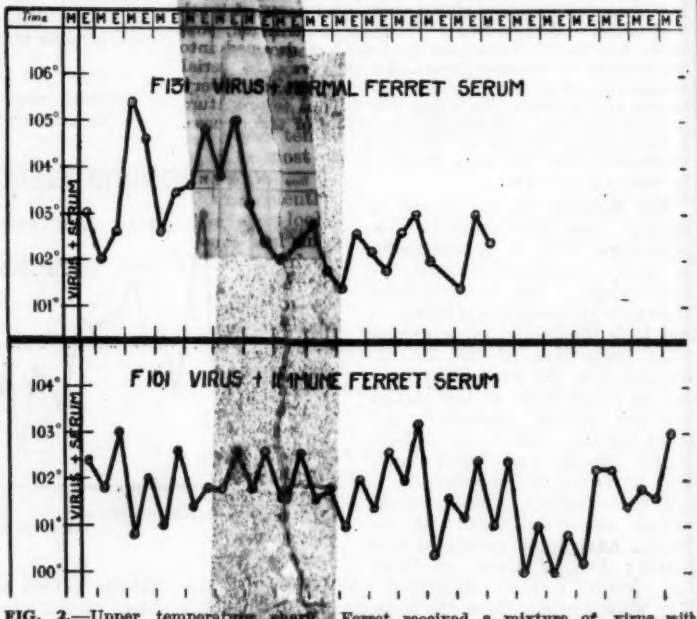

FIG. 2.—Upper temperature chart. Ferret received a mixture of virus with normal ferret serum. Lower temperature chart. Ferret received a mixture of virus with immune ferret serum.

Summary and Discussion

A disease of ferrets, produced by the intranasal instillation of filtrates of throat-washings obtained from influenza patients, is described.

The disease is transmissible serially in ferrets either by contact or by the intranasal instillation of virus-containing material.

The infective agent has, so far, only been recovered from the nasal passages of sick ferrets.

The disease was produced by five of the eight throat-washings obtained from influenza patients in the early stages of the disease.

Throat-washings from healthy persons and influenza convalescents caused no illness in ferrets.

The nasal secretions from a subject with a severe common cold caused no illness in ferrets.

Human sera, particularly those from influenza convalescents, were found to contain antibodies capable of neutralising the virus of the ferret disease.

Swine influenza virus caused a disease in ferrets which was indistinguishable from that produced by virus of human origin, and the pig and human viruses have close antigenic relationships.

We consider that the evidence given above strongly suggests that there is a virus element in epidemic influenza, and we believe that the virus is of great importance in the ætiology of the human disease. This view receives considerable indirect support from the fact that Shope found that the pig virus was the essential factor in swine influenza. The epizoötic disease could only be produced by combining two separate agents: (1) a virus; (2) *Hæmophilus influenzæ* (*suis*). The virus *alone* produced a disease so mild that it was difficult to recognise, and the bacillus *alone* appeared to be harmless. Our results with ferrets, so far as they have gone, are consistent with the view that epidemic influenza in man is caused primarily by a virus infection. It is probable that in many cases this infection facilitates the invasion of the body by visible bacteria giving rise to various complications. Analogous examples of this type of double infection are seen in swine influenza and dog distemper epizoötics. Decisive evidence on this point, and indeed on the importance of the virus we have described, can, we feel, only be secured by intensive study during an influenza epidemic, since direct experiments on man are fraught with difficulties. We are led to the publication of this preliminary note by the hope that our findings may be of assistance to those, wherever they may be situated, whose fate it may be to study the next epidemic of influenza.

We desire to thank the various practitioners through whose kindness we obtained throat-washings from influenza patients.

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HARMOL HYDROCHLORIDE AND *O-N*-PROPYLHARMOL LACTATE IN ANGINA PECTORIS

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Gunn and his co-workers [1 2] have shown that harmol and some of its derivatives (which are prepared from harmine, an alkaloid obtained from the seeds of *Peganum harmala*) exert a powerful dilator action on the coronary vessels in laboratory mammals. It therefore seemed possible that these drugs might be of value in the treatment of angina pectoris in man. Preparations of harmol hydrochloride, harmol lactate, and of *O-n*-propylharmol lactate have been supplied by Messrs. Boots Pure Drug Co., Ltd., to the Therapeutic Trials Committee of the Medical Research Council, at whose request we are at present engaged on a clinical investigation of this subject. A fuller report will be published later, and in the meantime the committee have asked the manufacturers not to issue these drugs for trial except through the Medical Research Council.

In angina pectoris, drugs may be used in three ways: (1) to cut short the attacks; (2) to forestall individual attacks, by giving the drug a few minutes before an attack is expected (i.e., before the patient gets out of bed, or before he goes for a walk); or (3) to reduce the frequency and severity of attacks by continuous treatment.

As regards the first of these methods of treatment—namely, the abortion of attacks—we have been able to show in two cases that harmol hydrochloride (gr. ½) when given by subcutaneous injection alleviates the pain, as one might expect in view of its proved pharmacological action. Clinically, however, we do not attach great importance to this finding, because the drug has an irritant action on the subcutaneous tissues, and similar relief can generally be obtained from the use of trinitrin or amyl nitrite, procedures which are obviously simpler and more practicable than subcutaneous injection.

The problem of anticipating and so preventing individual attacks is at present engaging our attention, and we are comparing the potency of the harmol derivatives with that of the nitrites, which are known to be of value for this purpose.

The assessment of the value of drugs in the continuous treatment of angina pectoris is a problem which presents the greatest difficulty from an experimental standpoint; for, not only is the frequency of attacks profoundly affected by emotional disturbances, by variations of temperature, and by other extraneous factors, but, even under apparently similar conditions, the number of attacks each day is apt to vary so greatly, in the same subject, that it is often impossible to obtain satisfactory control observations. For example, one of our patients who was treated with various drugs, and from time to time given merely a simple placebo, had during one control period, lasting 21 days, only eight attacks, while during a later control period, lasting 27 days, he had 96 attacks. Unless, therefore, the observations be continued over a prolonged period, with frequent controls, the impressions obtained are apt to be fallacious. Again, some patients suffering from angina become rapidly worse, in spite of all methods of treatment which may be tried, while others steadily improve, without any treatment. Clearly neither of these groups offers suitable material on which to test a new drug. It is only from patients whose condition remains fairly stable that therapeutic deductions are justified.

We have now studied the effect of continuous treatment with harmol hydrochloride by mouth in 41 cases of angina. In seven only was there any evidence that the patient derived benefit from the drug. This is not surprising, for Evans and Hoyle [3] have recently shown that none of the known vasodilator drugs is of any value for the *continuous* treatment of angina. Their action is too evanescent. In fact, the only drugs which appear to diminish at all the frequency of attacks are those which act centrally, such as the bromides, chloral, the opium derivatives, and phenacetin.

Except in a single instance, no toxic symptoms were observed with harmol hydrochloride in doses of grs. 2 or less by mouth three times a day, though larger doses were liable to give rise to epigastric discomfort, anorexia, nausea, vomiting, lack of energy, palpitation, and occasionally diarrhœa. Acute attacks of renal colic occurred in three patients who were taking large doses (grs. 4 or 5 three times a day).

We have also treated 20 patients continuously with *O-n*-propylharmol lactate by mouth. This preparation was shown by Gunn and Elphick [1] to be much more active than harmol hydrochloride as a coronary dilator, but also more toxic. The dose should not exceed gr. 1 three times a day. Four early cases appeared to derive benefit from this drug, but in the more severe type of angina no improvement was observed. It is only fair to say that in most of these cases other drugs reputed to be of value in the treatment of angina had already proved equally useless.

Further work is necessary before we shall be in a position to express an opinion regarding the value of *O-n*-propylharmol lactate in the continuous treatment of angina, or on the value of the harmol derivatives in preventing individual attacks; but from the preliminary observations referred to above we feel justified in drawing the following conclusions: (1) Given hypodermically in ½-grain doses during an attack of angina, harmol hydrochloride will relieve the pain; but owing to its irritant action on the subcutaneous tissues, this method is not practicable. (2) In the continuous treatment of angina harmol hydrochloride is without effect, but so are most other vasodilator drugs. (3) Toxic symptoms are liable to appear if the oral dose of harmol hydrochloride exceeds grs. 2–3, and that of *O-n*-propylharmol lactate exceeds gr. 1 three times a day.

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SOME PROBLEMS OF LOBAR PNEUMONIA*

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DURING the past 18 months, under the stimulus of responsibility for rather more than 200 pneumonia patients between the ages of 16 and 60, I have found it necessary to reconsider what is known about the pneumococcus, its mode of invasion, the lesion it produces, the recovery process, and the possibility of preventing or modifying infection and its subsequent results.

The Pneumococcus

From the standpoint of clinical pathology it is necessary to agree on the characteristics of the pneumococcus. The following points will probably be generally accepted: (*a*) it is a gram-positive diplococcus; (*b*) it is capsulated when pathogenic in man; (*c*) it is bile-soluble; (*d*) it ferments inulin; (*e*) it does not produce granularity in broth; (*f*) it readily undergoes autolysis; and (*g*) it is intensely pathogenic to mice and rabbits. These facts are important because there is no group serological reaction and its differentiation from the streptococcus may be by no means easy. Furthermore, the organism only partly fulfils Koch's postulates. Virulent organisms reproduce pneumonia only when injected into monkeys via the trachea, and the technique is far from simple. Other methods of injection may produce local abscess-formation, general septicæmia or general peritonitis, according to the method and site of injection, but not pneumonia.

The result of bacterial invasion must always be a mean between the virulence of the organism and the susceptibility of the host. At one end we have high virulence and complete susceptibility, and at the other, low virulence and complete resistance. The result is either septic infection and death in a matter of hours or, on the other hand, no lesion at all. As resistance to virulent infection rises, so the disease has the time in which to develop its proper signs and symptoms. From this it follows that in an animal like the rabbit, which is completely susceptible to the pneumococcus, inoculation results in septicæmic death within 48 hours. If, however, the animal be given a few prophylactic inoculations with a suitable vaccine, its resistance may be raised and, instead of a 48-hour death, we have a disease which lasts a few days, and may show pulmonary lesions but little removed from pneumonia. In this way the pneumococcus is brought almost within Koch's original postulates, and material help may be afforded for the more complete study of the serological and other changes taking place in the course of the disease.

Laborious and careful serological studies have given us at least four serological groups of pathogenic pneumococci, the fourth group being a very mixed bag of such organisms as are not agglutinated by sera from the other three strains, but yet can be regarded as legitimate pneumococci in that they have been recovered from clinical cases of lobar pneumonia and fulfil the conditions as regards morphology and other characters.

* Being the substance of a paper read before the Blackburn Medical Society, January, 1933.

It has long been known that the pneumococcus, in artificial culture, rapidly loses two things: its virulence and its capsule, and when this has occurred the colonies, as seen on an agar plate, lose also their bright, smooth, shining appearance; they become more opaque and develop a definitely rough surface. We have therefore five types of the organism: the four American groups and a rough form, into which any of these quickly degenerates on culture, becoming thereby alike non-capsulated and non-pathogenic. It seems logical therefore to regard the capsule as a structure of possible import, and this idea is strengthened by the known fact that pneumococcus type III. has a much more clearly defined and larger capsule than any other group, and equally it has a much higher virulence. Again, it is known that injection of the capsulated form of the pneumococcus into mice and rabbits gives rise to no phagocytosis, whereas injection of the rough non-capsulated form permits immediate phagocytosis, even in these animals, and no harm results. There is therefore the possibility of two separate problems: the diplococcus and its capsule, possibly the organism and its protective armour.

Extensive serological studies have revealed many other facts, some of which may have practical bearing. Antisera produced by injection of the decapsulated form of all the pneumococci give a reaction common to the species, but with no group distinction. Injection of the capsular substance produces no activity in the serum, for it is non-antigenic. The specific group serum is only produced when capsule and organism are together present as antigen. Chemical analysis has shown that the capsular material, the specific soluble substance, is a polysaccharide and that its chemical composition differs in the three recognised groups in that type I. contains nitrogen, type II. is dextrorotatory, and type III. is lævorotatory. This specific material is rapidly generated in pneumococcal infections and can be recognised in the body fluids, including the urine, at an early date after infection. This fact may be used to determine the type of an infection in some cases.

No toxin has as yet been identified experimentally, either from the organism, the capsular material, or the metabolic products of virulent pneumococci, in spite of the fact that pneumonia in the human subject is perhaps the best common example to-day of acute toxic disease.

The pneumococcus can frequently be recovered from the mouth or upper reaches of the respiratory tract of healthy persons. These organisms are commonly found to belong to the fourth group, which in itself means very little; the most important point to be determined is their pathogenicity. This procedure presents great difficulty, since virulence is rapidly lost in artificial culture unless special precautions are taken, and the animals commonly used are so susceptible that it is believed that the introduction of a single pneumococcus into the peritoneal sac of a mouse is likely to be fatal. The recently introduced method of applying the culture to the shaven abdominal surface may make this line of investigation rather easier in the future.

Antisera of high potency have been produced by systematic injection of horses. Such sera are capable of protecting against many times the minimal lethal dose of virulent homologous cultures. It has been shown that the antibody is carried down by the precipitated globulin fraction, and this means has been adopted for concentrating a serum, thereby diminishing the volume of a protective dose and avoiding the major reaction which results from a very

large dose of horse serum. Such sera have been found to react well with type I. infections, only half as well with type II. and not at all with type III. or group IV. There is some reason to believe that the serum acts by depriving the virulent pneumococcus of its capsule, thereby permitting phagocytosis and recovery.

Mode of Invasion

The fact that the pneumococcus can be recovered from the upper air-passages suggests that any cause which diminishes the resistance of the host may permit infection. On the other hand, many of the organisms found in healthy people have also been found to be avirulent, and this branch of inquiry sadly needs further work. Cases of pneumonia arising from exposure and alcohol, or both, are most commonly either type III. or group IV., and types I. and II. are essentially those which produce epidemics.

Both clinical and experimental evidence tends to show that infection takes place through the respiratory tract, but the problem still remains whether spread takes place (*a*) directly along the air-passages to one or more lobes, (*b*) via the lymphatics and peribronchial stroma, or (*c*) via the blood stream in the form of a temporary bacteræmia with subsequent fixation in the lung tissue, in exactly the same way as is known to take place in typhoid infections, where bacillæmia is the rule up to the ninth day, with fixation in Peyer's patches later.

Up till recently it was fairly generally held that invasion in pneumonia did take place in that way. Had this been true, then the earlier the blood cultures were made in the disease, the greater would be the chance of positive results, provided always that the number of observations was sufficient. Table I.

TABLE I.—*Blood Cultures*

First Series: Done occasionally

Day of disease	1	2	3	4	5	6	7	8	9	later.
Positive	—	2	3	3	1	6	1	2	1	2
Negative	1	4	15	33	38	29	20	23	5	—

Second Series: Cultures made daily

Day of disease	1	2	3	4	5	6	7	8	9	later.
Positive	0	0	1	2	4	3	4	2	2	1
Negative	1	9	17	30	31	29	24	24	14	6

Positive findings 10 per cent.

Mortality in Bacteræmic Cases

Day of disease	1	2	3	4	5	6	7	8	9	ater.
Type I. recovered	—	—	1	1	2	5	2	1	1	—
Type I. died	—	1	2	3	1	3	1	2	—	3
Type II. recovered	—	—	—	—	1	1	1	—	—	—
Type II. died	—	—	1	1	1	—	—	—	—	—
Group IV. recovered	—	—	—	—	—	—	—	—	1	—

gives the results obtained in the past 18 months, but it must be remembered that positive findings will always be vastly more valuable than negative ones, since the 10 c.cm. of blood used must always leave a wide margin of error except in the very heavy infections. Other observers have been more fortunate in recovering the organism, largely because culture has been made more frequently. During the past few months cultures have been made daily until the temperature has become normal, and the proportion of positive findings has risen considerably. In spite of this, the fact remains still that it is not in the first three days of the disease, nor in the obviously more severe cases, that the positive findings are made.

Septicæmia therefore does not seem to be a necessary event in pneumonia. Such a view is further supported by the fact that consolidation of lung does not follow intravenous injection of the pneumococcus. The experimental evidence of R. L. Cecil and F. G. Blake, supported by the radiological pictures obtained from very early cases, goes to show that invasion of the lung begins at the lung root and spreads outward into the lobe, until the consolidating process is arrested by the dividing septa of the lung. Spread would therefore appear to take place along the supporting stroma of the viscus, since consolidation of the root area would most probably result in mere collapse of the peripheral lung tissue. This mode of invasion would explain the lobar distribution, a matter of some difficulty if septicæmic invasion be accepted. The positive blood culture thus becomes either a fortuitous event or an index of heaviness of infection according as recovery or death may follow.

The Pneumonic Lesion

The lesion produced is familiar to all; the three stages of congestion, red hepatisation and grey hepatisation constitute the A.B.C. of medicine. The change in colour from red to grey may be due to many factors—e.g., diminished blood entry; leucocytic invasion; decoloration by hydrogen peroxide, which the organism is known to generate; or tryptic digestion of the exudate. Grey hepatisation is believed to be an essential step in the process of resolution; when this stage is delayed or absent complete recovery cannot and does not take place. There is further evidence that when virulent pneumococci can be grown from material removed by lung puncture after the fifth day of the disease, a fatal result may be confidently expected. This procedure has not been used in this series, and it would argue strongly against the lung puncture method of typing, as some have suggested; although the fifth day in the disease is late for such a process, yet it is always necessary to catch hares before cooking them.

Clinical evidence and morbid anatomy alike teach us how relatively common, in pneumonia affecting one lobe, is a small consolidated area in the root zone of the other lung. This may well be borne in mind, since it may lead to the erroneous opinion that two whole lobes are consolidated, or that the classical tubular breath sounds are merely conducted to the opposite side of the chest. In this series both radiology and morbid anatomy strongly suggest that such small areas in the opposite lung are very common but have no bearing on the prognosis.

Resolution is believed to take place as the result of ferments arising from the dead bodies of the leucocytes, and two enzymes have been identified. It is possible that pyrexia and intoxication arise from the proteose absorption resulting from this liquefying process, and that the crisis is determined when the enzyme action goes beyond the proteose stage of digestion. Further lesions may, however, occur and allow the disease to extend beyond its allotted nine days, and this may be due to so-called delayed resolution or unresolved pneumonia, or to one of the many complications—still lesions produced by the pneumococcus.

There are probably few conditions which tax the resources of the clinician more than the case of pneumonia which fails to have a satisfactory crisis by the tenth day. The physical signs may show little or no change, or on the other hand, distinct recessional changes may appear; and yet the patient does not recover. It is tenable that a diagnosis of delayed resolution can and should only be made when every other complication has been carefully and surely excluded. To do this completely may

require wise judgment and not a little pluck. The spread of the consolidating process to another lobe of the lung does not by any means always indicate a prolonged attack, and critical examination of the clinical condition often gives no indications of further spread; pulse-rate, respiration-rate, and temperature are no higher, cyanosis is not increased nor toxæmia deepened, the condition of the other lobes being indicated only to radioscopy or stethoscope.

TABLE II.—*Type Incidence and Mortality*

—	Cases, total.	Deaths.	Relapse.	Crisis delayed beyond the tenth day.
Type I. ..	99	20	2	9
„ II. ..	41	18	2	1
„ III. ..	1	1	1	7
Group IV. ..	48	5	4	5

Note.—50 per cent. of patients reach hospital before the end of the third day of illness. All the cases of relapse recovered.

Early relapse may give rise to the gravest anxiety, but it appears that this is quite unfounded. This event is uncommon, and one is in agreement with other observers in that relapse usually lasts three days, is rarely or never fatal, may occur within seven days of the previous crisis, and is of course of the same type pneumococcus as the original attack. The serological events which permit of such an occurrence are not easy to interpret, for it is remarkable that protection by active immunisation can rise to a point at which recovery takes place, fall so rapidly as to permit of reinfection in under a week, and yet be able to rise again sufficiently rapidly to terminate the disease within only one-third of the usual time. The possibility of the relapse being due to invasion by pneumococci of another group must always be excluded, more particularly in hospital, where other cases of other groups are almost sure to be present in the same ward.

Much has been written about positive blood cultures, and it has become the rule to regard all such cases as severe infections. It appears from this series that a positive finding on a single occasion is of little moment, but that a very severe course is followed by all cases which show a constant bacteræmia. Such a conclusion makes it difficult to accept evidence of efficient serum treatment based upon cases where only once has the blood culture proved positive.

Complications

Ulcerative endocarditis due to the pneumococcus is fortunately rare, but it is interesting, since its appearance forms one of the definite difficulties in the way of serum production for curative purposes. G. F. Petrie and others have recorded verrucose ulcerative endocarditis arising in horses during the process of immunisation for the preparation of protective sera. In these animals the persistent septicæmia often yields a rough form of the pneumococcus, whereas such cases as have occurred in this series have yielded the smooth, capsulated, virulent form of the same type as caused the original pneumonia.

Empyema as a complication or a sequel of lobar pneumonia is too well known to need more than passing reference. The causative organism is as a rule of the same type as the originating pneumonia. The pus is thick and creamy and contains the familiar fibrinous masses. The exudate forms a localised abscess shut off by pleural adhesions which can be opened by the surgeon at an early stage without fear of pneumothorax. Such cases usually heal quickly and well, with satisfactory lung expansion. It is this group which yields such satisfactory results, as opposed to the streptococcal group which is still liable to a high mortality.

In this series the hectic temperature and profuse sweating commonly thought to be indicative of empyema formation was not seen, and in most of these cases the time from the termination of the pneumonia to the opening of the empyema was almost or quite apyrexial; it is probably important to appreciate that this is so in the pneumococcal group, as contrasted with the streptococcal group, where much more pyrexial upset is liable to occur. It was found, in common with most other observers, that the type I. organism was most frequently responsible for the abscess.

TABLE III.—*Complications: Empyema Developed in 14 Cases*

Type I. ..	.. 7 cases.	Group IV. ..	.. 2 cases.
„ II. ..	.. 1 case.	Fœtid ..	.. 2 „

Pyopneumothorax: 2 cases (type I. and group IV.).

Fœtid empyema as a sequel to pneumonia is a recognised though rare event, which would argue gangrene of lung or a bronchial fistula. In either event we should expect a fœtid sputum, containing the same multiplicity of organisms as is found in the fœtid pus of the empyema, but this was certainly not so in three of the four cases which occurred in this series.

Pyopneumothorax arising in the course of pneumonia is so unexpected as possibly to lead to the opinion that the tubercle bacillus is the likely cause. Such an error is easily corrected by finding in the pus the same type pneumococcus as caused the originating pneumonia. The subsequent treatment is difficult, and must be largely determined by observation of the intrapleural pressures, but a happy result may be obtained in some cases. It should be remembered that pneumothorax, when the lung is consolidated, is not followed by collapse of the solid area, but mediastinal dislocation from a rising intrapleural pressure may still occur and become a definite menace.

Pneumococcal arthritis appears to be uncommon, but its method of origin is not in doubt when bacteræmia is known to have been present. Evacuation of the pus by aspiration shows the presence of a good deal of admixed glairy mucus, and the same type-organism as caused the original pneumonia. Normal saline is very lethal to the pneumococcus, and washing out the joint with this fluid through the aspirating needle is quite effective and in some cases an actual "restitutio in integrum" can take place.

Although pneumococcal meningitis is well recognised as a complication of pneumonia, yet it has not been correctly diagnosed in any case in this series. It is known to have occurred in two cases, for it was found quite unexpectedly at routine post-mortem examination. Its frequency, however, is not known, since many fatal cases were not subsequently examined, in the absence of permission.

Recovery

The process of recovery, as observed clinically, is so striking as to invite postulates on the precise mechanism which brings it about. It is well known that the extent of the consolidation does not determine the severity of the symptoms, any more than the cyanosis indicates the amount of lung tissue out of function. The crisis is accompanied by no recognisable changes in the lung condition, yet the drop

in frequency of pulse and respiration is no less marked than that of the temperature.

We are therefore driven from a mechanical to a toxic explanation of the respiratory condition, and the grade of toxæmia is our estimate of the severity of an attack. A slowly acquired active immunity in which the antitoxic value of the circulating fluids suddenly overtops the toxic state would provide an adequate explanation of the crisis with all its accompaniments. The fact remains, however, that no toxin from the pneumococcus has ever been demonstrated. Dead pneumococci in enormous numbers can be injected intravenously without any effect, the blood from a heavily infected moribund rabbit may be filtered and injected into another rabbit without any effect whatever; enormous doses of culture-filtrate are tolerated by mice; concentrated specific soluble capsular substance is quite innocuous. It is conceded that agglutinins may arrest blood infection, precipitins may neutralise specific polysaccharide and together a bacteriotropic effect may be produced which permits of phagocytosis; but the fact still remains that there is no evidence whatever for any belief in a toxin-antitoxin reaction. We are thus left without an explanation of the outstanding feature of the disease, but it is one of the characteristics of the pneumococcus that it undergoes autolysis and disappears from cultures in two or three days; this inherent character may account for the crisis.

Again, the range of growth of the organism only extends to an acid death point of pH 5·0, and it has been shown that the press-juice of the consolidated lung may become sufficiently acid to cause the death of the organism. Further, the pneumococcus has been shown to produce hydrogen peroxide in the process of growth, and it is possible that this product in the lung may inhibit or kill off the organism at a certain point. We thus have three factors which together or separately may account for the crisis without postulating any antitoxic process which so far has never been demonstrated.

The early relapse, so short a time after crisis, would indeed be very difficult to explain were a toxin-antitoxin reaction responsible for the crisis, but at the same time the very character of the relapse attacks demonstrates that some protective mechanism must be at work. There seems to be no acquired immunity to speak of after an attack of pneumonia, and recovery takes place from factors other than those of immunity. This very factor of absent immune protection has of course been recognised for a very long time, as it is known that each attack of the disease seems to render certain individuals more liable to another. Since experiment has failed to show any toxin-antitoxin reaction with the pneumococcus—and since the agglutinins, precipitins, and bacteriotropins are said to be only concerned with the prevention or cure of a pneumococcic septicæmia—it appears that the source of the bactericidal substances in the consolidated area should be from the leucocytes and the known products of the pneumococcal metabolism such as acid and hydrogen peroxide. Resolution is believed to take place from ferments liberated by the dead bodies of the leucocytes, and thus it appears that factors promoting resolution are acidity, oxidation, and diminished serum antitrypsin. The enzymes liberated by the dead leucocytes are said to produce proteoses from the inflammatory products and these are capable of causing pyrexia on absorption, but when the proteolytic process has gone beyond the stage of proteose production, pyrexia is no longer caused by absorption and the temperature falls critically.

Turning now to the clinical side of the crisis, it is by no means uncommon to find that the temperature which previously had been high has fallen to normal, but without any amelioration of the clinical condition; the pulse- and respiration-rate have not dropped and the temperature soon rises again. Such a fall of temperature frequently antedates the crisis by 24 hours. The physical signs in the lungs show no changes whatever, and even the appearance of redux crepitus is not in any way dependant upon the crisis, for it may appear several days before or not until some days after the crisis.

There appears to be no connexion between early crepitus of the large moist variety and an early crisis. Nor is there any connexion between so-called massive pneumonia, in which an obstructed bronchus obliterates the loud breath sounds, and the severity of the attack; in fact most patients, if carefully watched, will show this sign at some time or other in the course of the disease. If we are at a loss to explain the crisis pathologically, so are we also unable to fortell its occurrence, or even to recognise the fact that it has taken place by any change in the clinical condition of the lung.

In this series of cases a certain number of temperature charts have shown a sudden critical drop to normal with a return to the previous high level within the next four hours. In some of these there was clinical evidence that extension to another lobe took place at this time; it is therefore possible that crisis had occurred in the original consolidated area but that spread had taken place into another lobe. If this be so, then it must follow that crisis in the second affected area is reached in the remarkably short time of 24 to 48 hours, such being the usual period to elapse before the true and permanent crisis takes place.

Prevention and Treatment

The close association between the catarrhal cold or influenza on the one hand and broncho-pneumonia on the other does not appear to apply to acute lobar pneumonia, although it is very true that the same climatic conditions favour all these lesions. The amount of crude dirt in the atmosphere has been shown statistically to have a very direct bearing, and it might be profitable for this great industrial area (Blackburn) to pay more attention in the future than it has done in the past to the diminution or prevention of atmospheric pollution, for it is quite possible to prevent the pall of smoke over a town.

It is usually held that types I. and II. of the pneumococcus are chiefly responsible for the epidemics of the disease, and these appear to return with great regularity during the winter months of each year. Type III. in this series cannot be said to exist and there is much evidence that group IV. is a very much milder variety than the rest. Prophylactic inoculation by three large doses of pneumococci types I. and II. might therefore reduce the incidence of the disease to a very considerable degree if used throughout a community, and such figures as exist on this subject do show very encouraging results both in America and South Africa. No attempt along these lines has been made in this country, but it is rather obviously a method which might well be tried by those individuals who repeatedly suffer from pneumonia, more particularly if an autogenous vaccine against their own special variety of the pneumococcus can be made. It must, however, be remembered that no antipneumococcal vaccine

is likely to be effective unless the capsulation and the virulence of the organism are maintained up to its death point.

The hospital treatment of pneumonia, carried out as it is in wards set aside for the purpose, must increase the risk of infection to all workers within the ward. For this reason, amongst others, the nursing of this series of cases has been carried out with the ward windows permanently wide open whatever the weather. Although the wards are always cold, yet the patients prefer it so, and usually complain bitterly if the windows, having been closed for the physical examination, are not opened again as soon as the patient is covered up. It is probable that this practice has materially helped to protect the workers from infection and the patients from cross-infection. It is probably equally important to adopt the same precautions in the private house, where infection of other members of the family takes place more frequently than seems altogether necessary.

The routine use of oxygen through a Woulfe's bottle, by which the rate of supply can be easily gauged, for 15 minutes in every hour, for all cases showing cyanosis or respiratory embarrassment, has been adopted. The gas is always delivered through a nasal catheter and has caused little complaint. The method seems to be the best, simplest, and most efficient with due regard to economy.

The routine use of digitalis is not regarded as desirable, but the frequency of spasms of auricular fibrillation make this a feature which will always require careful exclusion. A special watch for them should be kept, and when they appear digitalis in full doses is urgently called for. A few minims four-hourly would then appear to be futile, but the steadying effect of three or four drachms will be seen in as many hours. The systematic use of glucose will help to protect the heart against the grave toxæmia of the disease, and it has been found that large amounts are tolerated without glycosuria; there appears therefore to be no call for insulin as well, as has recently been shown in diphtheria.

The only known group of drugs with any semblance of specific action in this disease is the quinine derivatives, and of these optochin is the best known. There is some evidence to show that, if administered early in the disease, it tends to cut short the attack, but its toxic qualities have made it unpopular; optic atrophy is said to have resulted from its use.

Much harm may be done by frequent washing and sponging of the patient, particularly if the temperature is thereby lowered, since most patients running a high temperature are showing a good response and finally emerge well from the ordeal.

Although vaccines have been recommended and have been stated to yield good results, yet it is difficult to believe that much can be accomplished within the very short period which the disease allows. On the other hand, the specific serum treatment seems to be gradually gaining popularity even in this country. A critical survey of the literature, which has now reached considerable proportions, goes to show that it offers very definite help, but it also suffers from rather rigid drawbacks which are common to all forms of serum treatment. To use the serum in cases which are fundamentally unsuitable is likely to do the patient no good and to bring the preparation into disrepute. It may be well, therefore, to lay down some definite rules, for which the following are suggestions.

(1) The serum is only useful against types I. and II. pneumococcal infections.

(2) There are reasons to believe that the dose given in type II. cases should be twice that recommended for type I.

(3) The dose must be adequate, and herein lies a difficulty, for the standardisation of the serum is difficult and the dose as yet is not agreed upon; but it must be very large.

(4) The serum must be given intravenously and it is possibly a mistake to dilute it with normal saline unless that fluid has been specially prepared to avoid thermal reactions.

(5) The modern concentrated globulin can be given with much greater safety from anaphylactic reactions than the whole serum and a much smaller volume is required.

(6) A syringe containing 1 c.cm. of 1/1000 adrenaline solution should always be at hand and, on the appearance of signs of anaphylaxis, this should be emptied into the muscles or vein.

(7) It is possibly true that serum gives its most brilliant results in bacteræmic cases, but the disappearance of the organisms from the blood stream does occur in a certain proportion of such cases without this artificial aid.

(8) It is probably futile to administer the serum after the end of the third day of the disease, since by then it has become almost impossible to administer the volume which would be required to neutralise the amount of antigen present.

From this it is obvious that two difficulties remain to be overcome: first, adequate dosage; and secondly, early determination of the type of pneumococcus responsible for the lesion. From the clinical, as opposed to the academic, point of view it is only necessary to answer the question: is this a type I. or type II. infection? for if it is not, serum treatment is inapplicable. This problem in some cases can be solved with speed and accuracy; for R. R. Armstrong, utilising the Neufeld phenomenon, has shown that pneumococci in the sputum, when mixed with homologous antiserum, undergo a marked swelling of their capsule which can be recognised under the microscope, and F. C. O. Valentine has further shown that this swelling can be demonstrated by suitable staining. In this way, provided sputum containing pneumococci can be obtained, a type diagnosis can be made in half an hour. The same may sometimes be done with a generous posterior pharyngeal swab, even in the absence of sputum, and this procedure offers an enormous saving of very valuable time when a type diagnosis is urgently needed before a line of treatment can be laid down. For academic inquiry the peritoneal mouse method, which has been used in this series, is still preferable because the group IV. cases require demonstration of the presence of definite pathogenic true pneumococci if the observations are to be of any value.

It is my pleasant duty to offer my warm thanks to all my colleagues at Hope Hospital for their long and unfailing help in the work involved in this series of cases, and particularly to Dr. Lois Stent, who has carried out the highly important typing reactions with such skill and promptitude.

NEW X RAY DEPARTMENTS.—Mr. H. F. Smithson, chairman of the West Yorkshire joint district miners' welfare committee, recently opened a new X ray and therapeutic department at Clayton Hospital, Wakefield. The building and its equipment have cost £16,200, which was granted by the Miners' Welfare Fund.—An enlarged and re-equipped X ray department at Preston Infirmary was recently opened by the mayor of Preston, Alderman Dr. T. H. C. Derham. The work has cost £1625, and the equipment has been provided by the social and recreation clubs of Preston and the district. At the opening ceremony it was stated that the greatest need of the hospital is an enlargement of the maternity department. Each week at least 20 expectant mothers are refused accommodation.

FATAL CASE OF AGRANULOCYTIC ANGINA TREATED WITH NUCLEOTIDE K-96

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THOUGH agranulocytic angina was described by Schultz [1] over a decade ago, the disease only recently appears to have attracted attention in Great Britain, and of the limited number of cases which have been reported to date, in only one does the therapeutic effect of pentose nucleotide, introduced by Jackson and his colleagues [2] in 1931, appear to have been studied. This was the case reported by Bulmer [3] in THE LANCET on May 27th; the patient recovered after injections with nucleotide K-96,* and as the more important contributions to the subject were summarised, further reference to the literature would be redundant in this report.

Our case was of unusual interest because the patient was continually under the personal observation of one of us (H. H. S.) from the onset of the disease, which extended over a period of five years.

CASE RECORD

H. S., 59 years, married. One child, a son, killed in an accident in 1922.

Family History.—Mother died when patient was born. Father died, aged 43 years, in 1893 from tuberculosis.

Previous History.—Measles when about 12 years old. Went abroad for a trip to New Zealand twice, first in 1894, and later in 1896, returning in 1898. No illnesses there. Residence abroad subsequently: in South Africa, 1901–1905; Jamaica, 1911–1919, with trips home (with husband on leave) 1913, 1915; Hong Kong, 1919–1921. Also transitorily in Japan, Canada, on way to and coming back from Hong Kong. Since 1922 has lived in England. No illnesses at any of those places abroad; no malaria.

Early Attacks.—From January, 1928, has had attacks of fever lasting a few days without other signs or symptoms. The temperature was usually 101°–102° F., rarely higher. On one occasion the fever lasted ten days. These attacks were generally regarded as "influenza," and at first came on at intervals of three months or so, but a similar one in 1931 occurred after a six months' interval.

Attacks during 1930–1932 nearly always followed exertion of some sort; the temperature would rise in the evening with headache and a feeling of chilliness, and after three to four days or so would drop, and recovery would be rapid, but the fever might last for a week. The blood was frequently examined for malaria parasites, invariably with negative results, while the blood picture was one of leucopenia with relative lymphocytosis. Since 1930 the patient had felt the cold severely, and from early autumn to late spring she never seemed to get really warm; two blankets, a rug, and eiderdown were needed till well into the spring, and almost always one, often two, hot-water bottles. In 1932 attacks were frequent, and were nearly always ushered in by a shivery feeling or by actual rigor. With the history of tuberculosis in the father, and considering the fact that these attacks started with shivering and followed closely on exertion, the idea of auto-inoculation from some tuberculous focus was entertained, but no physical signs could be detected anywhere, and X ray revealed nothing except a slight swelling about the mid-œsophagus, "not abnormal." During the summer of 1932 there was a little difficulty in swallowing acid fruits, unassociated with nausea or vomiting, but the patient who was always thin was not losing weight.

Intermediate Attacks.—About mid-July, 1932, another attack of the fever suddenly came on, and on the 24th the patient complained of pain near the anus (she thought "it might be hæmorrhoids"), and on the 28th, after a night of severe pain, a red, brawny swelling appeared in the right ischiorectal fossa. She was taken to the Beckenham Cottage Hospital, and Mr. R. H. Boggon came down to operate. No pus or sinus leading to the rectum was found, only boggy tissue, but a specimen of this tissue examined both microscopically and after inoculation into a guinea-pig was negative for tuberculosis. The incision sloughed considerably and showed little tendency to heal. On July 31st there was acute pain in the midsternal region, much aggravated on attempting to take food or even milk. An ulcer of the œsophagus was suspected. Œdema of the left leg occurred suddenly on August 1st. A week later, as the fever remained high (103°–104° F.), the patient was transferred to St. Thomas's Hospital where three blood counts were performed, and blood culture tried in various media with uniformly negative results. On August 11th total leucocytes 2400 per c.mm., and the differential count showed neutrophils 56·5 per cent., lymphocytes 36 per cent., monocytes 7·5 per cent. There was thus a neutropenia of 1356 leucocytes per c.mm., the normal count equalling 4000–7000 neutrophils per c.mm. Subsequent counts showed improvement. On August 19th total leucocytes 4800 per c.mm., and a differential of neutrophils 66 per cent., lymphocytes 31·5 per cent., monocytes 2·5 per cent., the neutropenia of 3168 per c.mm. being only slightly below normal.

The wound subsequently healed very slowly, and healing was incomplete on Sept. 8th when she left hospital, though the temperature had been down for some days.

On Sept. 24th the blood happened to be examined just at the time when the patient complained of feeling cold and looked blue; she went to bed and in half an hour was shivering with a typical attack. At this time the blood count was 1400 leucocytes per c.mm. (Table I.).

TABLE I.—*Leucocyte Counts in an Intermediate Phase of the Illness*

Date of observation in 1932.	Total leucocytes (per c.mm.).	Neutrophils (per c.mm.).	Differential count (per cent.).		
			Neutrophils.	Lymphocytes.	Monocytes.
Sept. 24th ..	1,400	868	62	36	2
,, 26th ..	4,100	1,394	34	65	1
Oct. 8th ..	3,800	2,090	55	45	0
,, 22nd ..	3,100	1,054	34	63	3
Nov. 7th ..	3,360	1,882	56	42	2
,, 19th ..	3,710	1,774	47	50	3
Dec. 3rd ..	4,400	2,464	56	42	2
,, 17th ..	4,400	2,948	67	32	1
,, 31st ..	3,530	1,659	47	51	2

The temperature rose to 104° F. that day, but came rapidly down, and by the 26th was normal. Another count on the latter day equalled 4100 per c.mm. Blood examinations were made fortnightly, and are incorporated in Table I. There was never a true recovery of the white cells, though the count very slowly improved. No more febrile attacks occurred until Dec. 19th, when a sudden and severe rise of temperature, starting with a rigor, ensued. The temperature rose to 103° F. and, as on one previous occasion in 1928, the attack lasted for ten days; by the 29th the temperature was normal, and the patient remained well, but felt the cold, and was easily tired. It was at the onset of this attack that the œdema of the left leg disappeared, passing off completely in about 48 hours.

Final Attack.—On Jan. 10th, 1933, another similar attack began, but on the 11th she complained of sore-

* Nucleotide K-96 is a mixture of sodium salts of pentose nucleotides prepared, for intramuscular and intravenous injection, by Smith, Kline and French Laboratories, Philadelphia, under the direction of the Committee on Nucleotide Therapy of the Harvard Medical School.

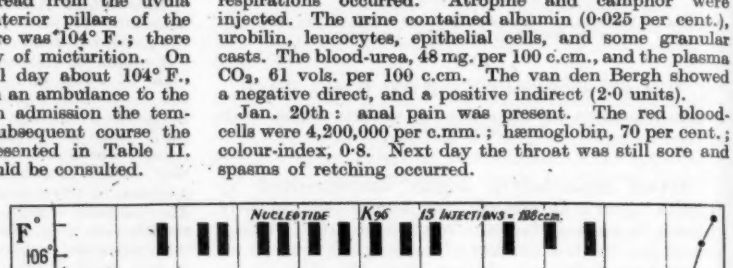
throat, and the right side of the fauces showed a nasty, angry-looking ulcer extending from the right side of the uvula to the tonsil; this made swallowing difficult, and a spray of Phenolaine had to be used before any milk could be taken. Two days later this had improved, but the other side now became involved and an ulcer of ashy, almost gangrenous appearance, spread from the uvula over both sides, affecting the anterior pillars of the fauces. On the 14th the temperature was 104° F.; there was a little delirium and frequency of micturition. On the 15th temperature remained all day about 104° F., so in the evening she was brought in an ambulance to the Hospital for Tropical Diseases. On admission the temperature was 104·8° F. For the subsequent course the accompanying Chart and data presented in Table II. concerning the leucocyte counts should be consulted.

Laboratory Investigations. — The results of various examinations on Jan. 15th and 16th were as follows: Urine showed a specific gravity, 1018, contained albumin (+), a trace of acetone, a few leucocytes, epithelial cells, and granular casts. Urea, 3·4 per cent. The fæces were negative for ova and protozoa. Examination of the blood showed red cells, 4,400,000 per c.mm.; hæmoglobin, 70 per cent.; colour-index, 0·8; average corpuscular diameter, 7·3 microns; leucocytes, 2300 per c.mm.; neutrophils, 1 per cent.; lymphocytes, 94 per cent.; monocytes, 5 per cent.; blood-urea, 55 mg. per 100 c.cm.; cholesterol, 128 mg. per 100 c.cm.; plasma CO_2, 52 vols. per 100 c.cm.; van den Bergh, direct reaction negative; indirect positive (1·5 units). The serum on this and subsequent occasions presented a peculiar pale green tint, the pigment responsible giving no spectrum and being soluble in alcohol, but only slightly if at all soluble in ether; probably it was biliverdin, but sufficient serum was not available for more complete investigation.

Jan. 17th: nausea, retching, and headache were present, and blood culture was negative on the following day.

Jan. 19th: the patient was drowsy, and bouts of sighing respiration were noted. At times the respiration was periodic in type; at other times Cheyne-Stokes' respirations occurred. Atropine and camphor were injected. The urine contained albumin (0·025 per cent.), urobilin, leucocytes, epithelial cells, and some granular casts. The blood-urea, 48 mg. per 100 c.cm., and the plasma CO_2, 61 vols. per 100 c.cm. The van den Bergh showed a negative direct, and a positive indirect (2·0 units).

Jan. 20th: anal pain was present. The red blood-cells were 4,200,000 per c.mm.; hæmoglobin, 70 per cent.; colour-index, 0·8. Next day the throat was still sore and spasms of retching occurred.



Day Dis	5	6	7	8	9	10	11	12	13	14	15
Pulse		104-126	100-120	102-120	104-124	104-124	100-120	108-120	112-120	110-136	136-164
Resp		24-28	22-24	20-28	20-24	20-26	26-28	24-28	24-28	28-38	26-32
Date	15	16	17	18	19	20	21	22	23	24	25

Temperature chart in case of agranulocytic angina treated with nucleotide K-96.

Jan. 22nd: the tongue was red, furred, and dry; râles were present at the right base, and there was some œdema of the feet; the patient was semi-comatose, breathing was more laboured, and there was a mucous rattle in the throat. Camphor was injected.

Jan. 23rd: the red blood-cells were 3,780,000; hæmoglobin, 70 per cent.; colour-index, 0·9; average diameter of corpuscle, 7·5 microns; blood-urea, 58 mg.; van den Bergh, direct negative, indirect, 1·0 unit; plasma CO_2, 58·6 vols. Urine contained albumin, urobilin, some leucocytes, red cells, and granular casts. Clinically breathing was laboured, and the respirations equalled 28 per minute. The blood pressure S/D, 118/75. Peri-anal, serpiginous ulceration was noted, unattended by inflammatory reaction. Micturition frequent, spasmodic, and accompanied by considerable local pain (probably from the local ulceration).

Jan. 24th: the patient was drowsy, the temperature was high (104° F.), and the sphincters incontinent. Injections of nucleotide were finally suspended, and on Jan. 25th cardiac stimulants and morphia were given. The patient became comatose with hyperpyrexia (107·2° F.), and died at 8.20 P.M.

TABLE II.—*Leucocyte Counts in the Fatal Relapse with Ulcerative Angina*

Date of observation in January, 1933.	Nucleotide K-96 (c.cm.)	Total leucocytes (per c.mm.)	Neutrophils (per c.mm.)	Differential count (per cent.).		
				Neutrophils.	Lymphocytes.	Monocytes.
16th ..	10	2,300	23	1	94	5
17th ..	20	2,000	60	3	92	5
18th ..	20	1,200	24	2	92	6
19th ..	20	1,100	11	1	94	5
20th ..	20	1,100	22	2	93	5
21st ..	10	560	11·2	2	85	13
22nd ..	10	—	—	—	—	—
23rd ..	18	750	7·5	1	96	3
24th ..	0	525	21	4	86	10

Treatment.—The injection of nucleotide K-96 was commenced on Jan. 16th, 10 c.cm. being given intramuscularly. Injections were subsequently continued as detailed in Table II., two intramuscular injections being given daily on most occasions. On the 23rd the first injection was administered intravenously following an injection of 5 per cent. glucose, but owing to the rapid development of dyspnœa the injection had to be discontinued when 8 c.cm. had been given. Atropine was frequently given before injections to minimise the reaction.

Progress Notes.—On Jan. 16th, 1933, the temperature reached 105° F.; vomiting occurred, the tongue was dry, red, and coated, and the tonsils congested and ulcerated, but physical examination revealed no other abnormality. Blood pressure S/D, 118/80. Dr. L. J. Witts saw the case in consultation, and confirmed the diagnosis of agranulocytic angina.

SUMMARY

Clinical.—The outstanding clinical feature in this case is its chronicity, and the long series of self-limited febrile attacks characterised by leucopenia and relative lymphocytosis without localising features. An ischiorectal swelling in July, 1932, unassociated with pus formation, was the first of these; 18 days later a neutropenia of 1356 cells per c.mm. was present. These findings first suggested agranulocytosis as a diagnosis. From September to December, 1932, the neutrophils varied between 868–2948 cells per c.mm., during which period venous thrombosis involving the left leg was present, and latterly dysphagia. In the final attack (January, 1933) the ulcerative angina and peri-anal ulceration associated with profound neutropenia were typical. Death occurred in coma with hyperpyrexia.

Laboratory.—Detailed laboratory investigations were made during the final attack, one very interesting observation not previously mentioned being the pale green colour of the serum. The pigment responsible was readily soluble in alcohol, but only slightly, if at all, soluble in ether, and showed no characteristic spectrum; its probable nature was biliverdin. The bilirubin content of the serum was somewhat increased, varying from 1·0–2·0 van den Bergh units (indirect reaction); the direct reaction was negative; the plasma CO_2 varied from 52–61 vols., and the blood-urea from 48–58 mg. per 100 c.cm. The urinary output was normal, the fluid balance satisfactory, and though the urine did, from time to time, contain abnormal elements, there was no evidence of nitrogenous retention or severe impairment of renal function. It follows that the dyspnœa and periodic breathing noted during the course of the illness were of central toxic origin and unrelated to either renal dysfunction or acidosis. Hæmatological investigation revealed only mild changes in the red cell counts, a striking neutropenia varying from 7·5–60 cells per c.mm., and a complete absence of other granulocytes either eosinophils or basophils. Hæmoculture was negative, a finding in accord with the view that such bacterial infections as do occur are secondary to the neutropenia, and not primarily responsible for the failure of granulopoietic function.

Treatment.—The complete absence of response following nucleotide K-96 injections was a most disappointing feature, and the large number of self-limited febrile attacks manifest by this patient indicates the need for caution in regarding the recovery from agranulocytosis either as permanent or necessarily related to specific drug therapy.

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FAT EMBOLISM

TWO FATAL CASES

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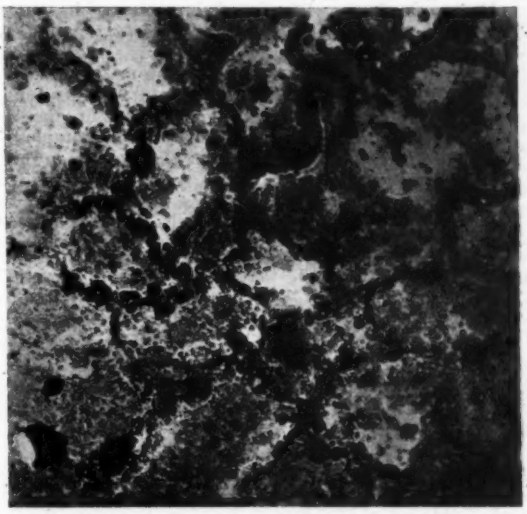
CASE 1.—A. B., a male aged 19, was admitted to the Aberdeen Royal Infirmary on Sept. 3rd, 1932. About 4 P.M. that day he had injured his right leg in a motor-cycle accident. The leg was immobilised by a long external splint before removal by ambulance, a distance of eight miles.

On admission he was suffering from shock but recovered on being put into a warm bed and being given gr. 1/6 morphia (5.45 P.M.). He had not been concussed. There was no evidence of injury to the body elsewhere. Urinary examination was negative; fat was not tested for.

Operation.—At 8 P.M. examination under general ether anæsthesia showed a wound 2 in. long on the outer aspect of the thigh leading down to an oblique fracture of the middle of the femoral shaft. Another wound on the inner aspect of the leg at the junction of the middle and lower thirds overlay a fracture of the tibia. The fibula was fractured in its upper half. Both wounds appeared relatively clean. The wound edges were excised, all deeper damaged tissues removed, and the skin sutured. Skeletal traction pins were passed through the lower end of the femur and the os calcis. The leg was put in a Thomas splint slung on a Balkan beam with weight extension. The total duration of anæsthesia was 75 minutes (℥xii ether being used). Five hundred units anti-tetanic serum were given.

Post-operative course.—Next morning he was conscious and complained of pain in the leg. In the afternoon he gradually lost consciousness; the pulse became weak and rapid (140 per minute); there was a progressive rise in temperature; the pupils were very small and hæmorrhages appeared in the ocular and palpebral conjunctiva. At 2 A.M. on Sept. 5th the temperature was 105° F. He died at 3.40 A.M., 36 hours after the accident.

A *post-mortem examination* showed much bruising of muscle and fat in the neighbourhood of the fractures but no evidence of sepsis. The brain was normal except for one or two minute hæmorrhages in the right thalamus. There were fairly numerous petechial hæmorrhages in the pleura and slight gelatinous exudate in patches over the lower lobes on both sides. Both lungs were very deeply congested and the bases showed early broncho-pneumonia with slight hæmorrhages in places. All the chambers of the heart were dilated. Numerous petechial hæmorrhages were present on the epicardial and endocardial surfaces, especially the latter.



Photomicrograph of lung, showing fat emboli in capillaries, and one blood-vessel completely filled with fat. (From Case 1.)

Microscopically the lungs revealed a very extensive fat embolism. Unfortunately pieces of the other organs were not kept for microscopical examination. (See Figure.)

Clinically this case was one of the cerebral type of fat embolism rather than the pulmonary type.

The outstanding feature of this case was the difficulty in diagnosis. The small pupils and high temperature suggested a pontine hæmorrhage. At the post-mortem death was thought to be due to a septicæmia from the wounds. Only on microscopy of the lungs was a definite conclusion reached, though I had suspected fat embolism some time before death. In the first of the two cases reported by Wright[1] the condition was almost missed even at post-mortem.

CASE 2.—C. D., a male aged 22, suffering from a chronic infective condition of the left hip, was admitted to the City Hospital, Aberdeen.

He was put in abduction and extension from Jan. 3rd to July 19th, 1926. At the end of this period movements of the left knee were very limited and manipulation was advised. On Nov. 31st, under ether anæsthesia, considerable adhesions of both knees and ankles were broken down. The operation was done at 10.30 A.M., only four ounces of ether being administered. Two and a half hours later

[1] Wright, R. B.: Ann. of Surg., 1932, xcvi., 75.

he became cyanosed; the cardiac condition was fairly good. An hour afterwards the cyanosis was more marked; the pulse was thready and intermittent. He died at 3.40 P.M. that day. The organs removed at the post-mortem showed widespread fat emboli in the capillaries. There was a T-shaped fracture of the patella.

Clinically this was a case of the pulmonary type of fat embolism.

There have been many reported cases of fat embolism following orthopædic procedures, the liability to embolism being probably due to the atrophied bones containing more fat than normally. Usually it has followed injuries of, or operations on, the lower extremity.

Diagnosis during life is of importance in that treatment can be tried. Wright [1] states that "fat embolism should be considered in any case where there are grave or unusual symptoms following trauma whether the trauma be fracture, contusion, concussion, intravenous therapy, delivery, or operation"! Warthin [2] in his excellent and most complete communication on the subject gives eight points in the diagnosis:—

1. Injury to bone-marrow or adipose tissue.
2. A cardiac, pulmonary, or cerebral complex or these combined. (Restlessness, stupor, coma, dyspnœa, cough.)
3. Free fat-droplets in sputum: fat containing alveolar cells in sputum.
4. Free fat-droplets in urine.
5. Examination of eye-grounds for evidence of fat in circulating blood.
6. Examination of venous blood for fat-droplets.
7. Increase of temperature, rather than a lowered temperature.
8. Examination of skin for petechial hæmorrhages.

Warthin regards the presence of fat in the sputum as a most important and early sign, fat occurring in the sputum before the urine.

Prophylactic measures have been advocated, such as the routine employment, and the slow removal, of tourniquets after operations on the limbs likely to give rise to embolism, the incision of tense hæmatomata, and even the drainage of blood from the saphenous or femoral vein by cannula on removal of the tourniquet.

Treatments employed for an established fat embolism include the injection of 2 per cent. sodium carbonate (formation of a soluble soap), venesection, injection of large quantities of saline solution subcutaneously or intravenously, drainage of the thoracic duct, the application of a tourniquet and opening up the operation wound.

I have to thank Mr. G. H. Colt for permission to publish the first case and Dr. J. Gray for his report on the post-mortem findings, also my thanks are due to Dr. G. S. Banks for the notes of the second case.

[1] Warthin, A. S.: Internat. Clinic, 1913, iv., 171.

MEDICAL SOCIETIES

THE ASSOCIATION OF CLINICAL PATHOLOGISTS

THE summer meeting was held in the Pathological Department of Ancoats Hospital, Manchester, with Dr. ARNOLD RENSHAW in the chair, when a discussion was held on

The Anæmias

Dr. A. F. S. SLADDEN and Dr. AGNES BODOANO (Swansea) communicated observations on the

LEUCOCYTE COUNT IN PERNICIOUS ANÆMIA

They said that the typical pernicious anæmia patient has either a leucopenia or at least a count near the lower end of the normal range; further, the polymorph cells tend to form a relatively lower proportion of all leucocytes than in normal blood. Cooke and Ponder had shown that the blood in pernicious anæmia had a relative excess of multilobed polynuclears, so that the weighted mean of lobe content per cell is increased. Observations based on 220 counts made on 160 patients by Dr. Sladden and Dr. Bodoano did not warrant the assumption that the raised mean lobe count is peculiar to pernicious anæmia and permanent; they indicated, however, that such a count is very common in pernicious anæmia and may thus help in early diagnosis, though it may also occur in microcytic anæmia. When an intercurrent infection occurs the excess of multilobed polynuclears is masked by the outpouring of immature cells. The mean value in polymorph lobes was found to be fairly constant for any one patient unless infection intervenes; a raised mean might therefore be found even during a remission of the disease, and this fact was occasionally of value in the diagnosis of what might be termed latent pernicious anæmia. The other aspect of leucocytes in pernicious anæmia to which they desired to draw attention was the characteristic leucopenia. The data examined did not warrant definite conclusions, but suggested the possibility of drawing a distinction between the course of the polymorph curve and the lymphocyte curve during the progress of a pernicious anæmia which might have value not only for prognosis and the control of treatment, but possibly also as a method of analysing the problems of cell-genesis in the bone-marrow or elsewhere. Dr. Sladden and Dr. Bodoano found the absolute count of lymphocytes to show a rise preceding the rise in the red cells as the result of liver treatment, and a fall preceding the fall of the red cells in relapse.

Dr. C. J. YOUNG (Bradford) read a paper on the Polymorphs in Pernicious Anæmia. From observations on the lobation of the polymorphs he concluded that there is both a diminished production of polymorphs and retardation in their removal from the circulation. The number of lobes per 100 cells was raised, attaining a figure in the neighbourhood of 317. This was characteristic of pernicious anæmia but the same state of affairs might be met with after hæmorrhage and after infection. Only by means of absolute lobe counts could it be ascertained whether it was due to diminished production or retarded removal of polymorphs from the circulation. In sepsis occurring in the course of pernicious anæmia, the output of polymorphs of Arneth classes I. and II. might increase and the mean lobe count fall as low as 2·5. Dr. Young attributed the low polymorph count in pernicious anæmia to the replacement of the myeloblastic by erythroblastic marrow.

Dr. G. W. GOODHART (London) asked whether it was justifiable to regard the degree of lobation of the polymorphs as an index of their age.—Dr. C. PRICE-JONES (London) asked what was meant by the age of polymorphs. He suggested that the degree of lobation of the polymorphs was an expression of the amount of work they had done; there being few polymorphs in the blood in pernicious anæmia

those present would have more work to do and would therefore acquire more lobes. Dr. Price-Jones commented on the difficulty of avoiding errors due to the personal equation in making lobe counts.—Dr. SLADDEN replied that once they had experience of the technique, different workers arrived at closely similar figures on the same preparation.—Dr. YOUNG pointed out that if degree of lobation is an expression of work, then there should be a marked shift to the right in conditions of leucopenia such as agranulocytosis, which is not the case.

Dr. N. H. FAIRLEY (London) communicated some

OBSERVATIONS ON SPRUE

He pointed out that Ashford's theory of intestinal moniliasis had still many adherents and had done much to cloud the issue. The clinical picture presented febrile morning diarrhœa with pale, bulky, gaseous, acid stools; there was loss of weight, asthenia, sore tongue, a megalocytic anæmia, and sometimes tetany. The disease might occur in natives as well as in white men in the tropics and subtropics. Attention was usually drawn to the condition before the anæmia had fallen lower than 2,500,000 to 3,000,000 red cells per c.mm. The Price-Jones curve was positive in 34 out of 44 cases observed. Achlorhydria was present in many cases but the gastric hydrochloric acid returned after successful treatment. Observations on the blood-sugar and serum calcium showed a deficiency and the basis of the disease was deficient absorption from the alimentary tract; this affected the anti-anæmic factor of Castle and thus accounted for the anæmia. Treatment was by substitution of the anti-anæmic factor and by diet; the diet should be high in protein and low in carbohydrates and fats.

Dr. G. J. LANGLEY (Manchester) spoke with regret of the disappearance of the strawberry treatment and commented on the difficulty of drawing conclusions as to the disease from cases observed under non-tropical conditions.—Dr. J. G. GREENFIELD (London) drew attention to the fact that in spite of the resemblance of the anæmia of sprue to that of the pernicious type, subacute degeneration of the cord was not seen in sprue.—In answer to Dr. JANET VAUGHAN, Dr. FAIRLEY stated that he had never heard of osteomalacia occurring as a result of sprue even of long-standing.—In answer to Dr. GOODHART, Dr. FAIRLEY stated that 20 per cent. of cases relapsed, but that this occurred mainly in patients living under adverse conditions. Relapse could be avoided by suitable diet low in fats and carbohydrate; it was advisable to persist with treatment with liver for six months after the blood picture had been restored to normal; once the gastric hydrochloric acid had returned to normal cases rarely relapsed.

OTHER COMMUNICATIONS

Dr. J. G. GREENFIELD and Dr. ELIZABETH O'FLYNN (London) communicated observations on the Relation of Pernicious Anæmia to Subacute Combined Degeneration of the Cord (see p. 62), and Dr. JANET VAUGHAN (London) read a paper on the Treatment of the Anæmias (see p. 63).

Dr. PRICE-JONES referred to a case of aplastic anæmia in which there had been temporary improvement under copper therapy.

Dr. S. C. DYKE (Wolverhampton), as hon. secretary of the association, reported the results of a questionnaire circulated to members on the diagnosis and treatment of pernicious anæmia. He stated that there was a general consensus of opinion that a firm diagnosis could not be made without employment of all the following procedures: estimation of hæmoglobin, enumeration of red cells, examination of stained film of blood, fractional test-meal, van den Bergh reaction of serum, estimation by some means of the mean diameter of the red cells. A positive van den Bergh reaction had been found in the vast majority of cases and except in very few instances was of the indirect type. There was general agreement that hydrochloric acid therapy was useless in improving the blood picture, but it was of service in combating gastro-alimentary symptoms; iron was found to be of no avail in the early stages of treatment when the colour-index was high, but it was of value when the red cells had been restored to something approaching a normal level, at which time the colour-index tended to fall.

Dr. F. B. SMITH (Preston) demonstrated the halometric device of Merlyn-Price and communicated observations on 85 cases of pernicious anæmia. Contrary to what is generally stated, he found the condition to be more common in women than in men; he also found that the megalocytosis did not disappear until the hæmoglobin had reached over 70 per cent.

Dr. DYKE communicated the results of an attempt to assay the value of preparation of liver for parenteral injection in the treatment of pernicious anæmia by means of the reticulocyte response (see p. 59).

In the subsequent discussion various speakers drew attention to the waste of money and material in the prescription of preparations of the anti-anæmic factor to unsuitable cases and in the use of inefficient preparations.

Dr. DYKE pointed out that the waste is not only of money and material, but also of human health and life, and stressed the fact that it is impossible to treat properly any case of pernicious anæmia without frequent examination of the blood.—Dr. JANET VAUGHAN stated that the same applied to cases of microcytic anæmia on iron therapy. Various members drew attention to the need for concerted action to put into effect the recent advances in the treatment of the anæmias.

The following resolution embodying the sense of the meeting was proposed by Dr. GREENFIELD:—

"That this association is of the opinion that the failure to provide laboratory facilities for patients under the National Health Insurance Acts, suffering from or suspected to suffer from anæmia, is responsible for much wastage both of material and of human efficiency and life, and considers that such laboratory service should be made available in recognised centres both for initial differential diagnosis and for the periodical examinations necessary to assure the maintenance of a sound state of health."

The resolution was seconded by Dr. GOODMAN PLATTS (York) and passed unanimously.

LEICESTER ROYAL INFIRMARY.—According to the report for 1932, 6902 in-patients were admitted, which is a small increase. Their average stay was 19·86 days, and the average cost per occupied bed was £152. Deaths within 48 hours of admission numbered 207. There were 14,000 new out-patients, but although this was a fall of 471, there were about 900 more attendances. There were 18,978 casualties, an increase of 1700; 338 traffic accidents were admitted to the wards, of which half were motor-car casualties; accidents with motor-cycles came next with 115. These patients spent 6906 days in hospital and cost £2886; 55 of them died, 17 from injuries received in motor-car accidents.

REVIEWS AND NOTICES OF BOOKS

Oral Spirochætes and Related Organisms in Fuso-spirochætal Disease

By DAVID T. SMITH, A.B., M.D., Associate Professor of Medicine, Duke University, School of Medicine, Durham, N.C. London: Baillière, Tindall and Cox. Pp. 243. 26*s*.

OWING to the extreme difficulty of obtaining them in pure culture the oral spirochætes have always been a refractory group of parasites to study, and Dr. D. T. Smith has attempted a big task in seeking to bring together into a readable form practically all that is known about them. The fact that to his monograph he appends a bibliography of 822 references indicates that he has not skimped his work. The conclusion he has reached is that there is no evidence, either clinical or experimental, that oral spirochætes alone can produce disease in man. He would regard them rather as members of a whole group of organisms, which includes spirochætes, fusiform bacilli, vibrios, and cocci, situated in the tonsils and about the teeth in a strategic position to initiate local lesions in the buccal cavity and the respiratory tract. The various diseases in which these organisms are found exhibit certain common characters—viz., necrosis and destruction of tissue, pseudo-membrane formation when the lesion is on a surface, and fœtid odour. Side by side with spirochætes there practically always exist fusiform bacilli, and the same confusion which has obscured the nomenclature of the spirochætes has also complicated the classification of the fusiform bacilli. Dr. Smith makes a tentative division into three types, based upon the assumption, for which there is considerable evidence, that the fusiform bacilli are simply different forms of spirochæte. Type I. is probably a variant of *T. buccale*, Type II. of *T. vincenti*, and Type III. of *T. microdentium*. It is inevitable, in view of the confusion which prevails, that much controversy should have taken place as to whether this development from fusiform bacilli into spirochætes and spirochætes into fusiform bacilli may take place in cultures as well as in lesions. Dr. Smith sides with G. Sanarelli in the view that fusiform bacilli do indeed change into certain types of spirochæte, and vice versa. The relationship of the spirilla, vibrios, and various other mouth organisms found in association with these spirochætes and fusiform bacilli is by no means clear, and Dr. Smith is content to reserve judgment.

Amongst the diseases in which this large class of organisms is found the author includes fuso-spirochætal angina, cancrum oris, necrotic gingivitis (trench mouth), pyorrhœa alveolaris, bronchiectasis, pulmonary abscess and gangrene, hospital gangrene, and certain cutaneous lesions of the genitalia. The organisms may also be found in the conjunctiva and the ear, and in the intestine. Indeed, they are so extensive in their distribution and have such a predilection for the buccal cavity that it is small wonder that clinicians are prone to seek from pathologists opinions on their real significance.

Especially interesting are the chapters on broncho-pulmonary spirochætosis and fuso-spirochætal pulmonary abscess and gangrene. Dr. Smith considers that the former disease, as it occurs in temperate climates, ranks next in frequency to tuberculosis, and is the most common of the chronic non-tuberculous infections of the lungs. He regards most cases of lung abscess, whether operative or non-operative, as caused by aspiration of infected material from the mouth, which explains the prevalence of the spirochætal group of organisms in the bacterial findings, and he recognises no sharp line pathologically between pulmonary abscess and chronic bronchiectasis. With regard to laboratory diagnosis he states that these organisms when infecting the lung do not give a positive Wassermann or a positive Kahn precipitin test, and that he has never seen spirochætes in the absence of fusiform bacilli. He emphasises for the benefit of inexperienced technicians the fact that the small fusiform bacillus is the type most commonly found in abscess and in bronchiectasis rather than the large fusiform bacillus which predominates in fuso-spirochætal angina. If attention is focused on the large fusiform bacillus the small fusiform types may readily be overlooked. His preference for the dark field apparatus over staining reactions for purposes of investigation will be shared by most observers.

This useful book does much to clear up the confusion and brings into harmony many isolated facts.

The Meaning of Animal Colour and Adornment

By Major R. W. G. HINGSTON, *M.C.*, M.B. London: Edward Arnold and Co. 1933. Pp. 411. 18*s*.

Major Hingston, a well-known writer among field naturalists, has given much pains to the setting out of a novel biological theory in this challenging book. On the title page the work is described as "a new explanation of the colours, adornments, and courtships of animals, their songs, moults, extravagant weapons, the differences between their sexes, the manner of formation of their geographical varieties, and other allied problems." The message of the book, the "new explanation," is briefly that animal colour and the tufts and plumes usually assumed to be sexual characteristics, as well as many of the extravagant shapes of antlers and tusks, have as their primary meaning a menace to foes. And in proof of this theory the author brings together examples founded on the appearance or behaviour of all sorts of animals in varying climes and circumstances, man being also submitted to the scrutiny. The wide range of information and the great industry with which the researches, described in the book, have been conducted, will win general commendation even where the writer is unable to make converts to his views.

That the bright colours of the appendages, manes, crests, and frills borne by so many animals, are not ornaments but weapons to be employed for the intimidation of enemies, is an assumption directly opposed to the accepted belief that animal coloration is largely protective—that, in other words, the external appearance of the animal should be inconspicuous in its environment if the animal is to escape attack. Major Hingston recognises the dilemma to which his explanation of pronounced shapes, tints, or markings among animals leads. The characteristics that are to ward off danger ought clearly to be immediately open to perception, while characteristics which are to assist in the concealment of the animal would have a very different quality. How can they act in both ways? To remove this difficulty from our minds many pages of the book are devoted, the solutions offered for the problem being very ingenious in numerous instances. An example of the reasoning

employed is furnished at the beginning of the book when considering the case of the lion. Regarding the male, save perhaps where maternal instincts are concerned, as the protector, and the female as the protected, it is pointed out that, while the main colour scheme of the lion is suited to protect him from observation in his usual habitats, when he does not desire to be seen, when he takes the open in anger, the bristling mane, the rotated ears, and the elevated tail-tuft combine to produce a fierce colour scheme. A similar use of pigmented areas in many dogs and wolves, skunks and badgers is described, among mammals, and then the animal world is submitted seriatim to similar testings.

The chapters relating to birds contain some elaborate notes on the meaning of song, the author holding that whatever be the intention of bright colours that same purpose must apply to song; thus, in contradiction of the usual belief, he decides that, just as bright colours form a fighting attire, the songs of birds are a trumpet of war. The hues of insects, like those of birds, are held to be a form of war-paint. After the publication of Darwin's "Origin of Species" it was seen at once that insects would form a group extremely convenient for the illustration of biological problems, whether associated with heredity or behaviour, for they were easy to observe, often abundant, conspicuous, and formed an economical material for experimentation. Major Hingston records much observation on the lepidoptera, where some of his general statements, on which deductions are founded, would not be accepted without controversy, as many exceptions to the rules could be cited. The notes on caterpillars are interesting. The arrangement of colouring, tufts, and spines, as well as the extraordinary attitudes assumed by these embryos, undoubtedly serve as protective weapons, and such only, since caterpillars cannot be concerned in sex rivalry. But though the purpose of the external embellishments of the caterpillar is single, they work in two ways. First, many of its most striking or gay markings actually help to blend it with its food plant, and secondly, the threatening attitudes are not permanent but struck only in the presence of danger. Caterpillars, in fact, supply an example of the double value of conspicuous traits.

The book is full of interesting observations, and illustrated, often very happily, by the author.

Colonic Irrigation

By W. KERR RUSSELL, M.D., B.S., Medical Officer in Charge, Light and Electrical Departments, Miller General Hospital. Edinburgh: E. and S. Livingstone. Pp. 191. 10*s.* 6*d.*

THE origin of colonic irrigation is lost in the dimness of the past, though, according to Dr. Kerr Russell, prescriptions for enemas have frequently been found on Babylonian and Assyrian tablets, and a chapter on the history of the clyster brings to light many strange uses for this method of treatment. Dr. Kerr Russell briefly reviews the anatomy and physiology of the large bowel and the flora and parasites of the intestines, and details the various types of apparatus suggested for colonic irrigation. Our own view is that complicated apparatus is to be deprecated, for it defeats its own purpose. If colonic lavage is to take the place of the purgative pill, and there is much to be said in its favour, the procedure must be made as simple as possible, so that it can be carried out by the patient in his own home without too much disturbance of the domestic routine. The case for the use of large amounts of fluid is no more convincing. When an opaque enema of less than a couple of pints is allowed to run in quietly at low pressure, one can see the cæcum filled and emptied if certain changes of position are made. When a large quantity of fluid is injected at high pressure it is doubtful whether much of the fluid ever gets past the lower part of the sigmoid, if as far. If the colon has to be very thoroughly washed, irrigation through an appendicostomy would seem to be the most reliable method. Dr. Kerr Russell makes short work of the dreaded "enema rash"; his happy experience that "the administration of a second injection effectively precludes the development of such a rash" is not the general one.

The book concludes with a list of the medicaments which can be used in colonic lavage, a hint of its dangers, and a list of the conditions in which it has proved beneficial. Many useful lessons are to be learned from Dr. Kerr Russell's book, which will repay study, even if the reader does not agree with all the conclusions. It is well illustrated, has a good index, and is clearly printed.

The Law relating to the Blind

By P. F. SKOTTOWE, LL.B., Barrister-at-Law. London: Butterworth and Co. 1933. Pp. 157. 7*s.* 6*d.*

Mr. Skottowe's little book on the Law relating to the Blind is carefully compiled and will be found useful by those who have occasion to consult it. The census of 1931 showed that there were over 60,000 blind persons in England and Wales. For their welfare Parliament has gradually acknowledged a larger public responsibility, mainly discharged through local authorities and voluntary agencies. Thus there is now considerable legislation in the form of statutes or statutory rules covering education and training, charities, and miscellaneous matters such as voting facilities, dog licence exemption, special postal rates for literature, and old age pensions at 50. Captain Ian Fraser writes a preface to this book, and his Blind Voters Bill, which has been passed by the House of Commons, is printed in an appendix.

The Anatomy of the Eye and Orbit

Including the Central Connexions, Development, and Comparative Anatomy of the Visual Apparatus. By EUGENE WOLFF, M.B., B.S. Lond., F.R.C.S. Eng., Ophthalmic Surgeon, Royal Northern Hospital; Pathologist and Lecturer on Anatomy to the Royal Westminster Ophthalmic Hospital. London: H. K. Lewis and Co., Ltd. 1933. Pp. 310. 31*s.* 6*d.*

THE subject matter of this book is based mainly on lectures and demonstrations given at University College and at the Royal Westminster Ophthalmic Hospital. Most of the illustrations of dissections are taken from preparations made by Mr. Wolff himself, and the diagrams also are original. The first three chapters on the orbit, the eyeball, and its appendages are strengthened by notes on the practical applications of anatomical detail to operative technique. Recent advances such as Duke-Elder's work on the structure of the vitreous are included. In the description of the vascular supply of the iris both the vascular circles used to be termed "arterial." Thomson Henderson maintained that they were both venous. Mr. Wolff calls the outer one arterial and the inner one arterio-venous. The canal of Schlemm is termed "sinus venosus scleræ." The structures in the ciliary body which Treacher Collins discovered 40 years ago and

believed to be glands are described without endorsing this view of their purpose. The functions of the different portions of the ciliary muscle constitute a physiological rather than an anatomical problem, but it is disappointing to find no help here in differentiating them. Appearances seen under the slit-lamp hardly come within the scope of this work, but they are indicated nevertheless in a short chapter. The extrinsic muscles of the eye, the nerves and vessels, and the optic nerve itself with its central connexions in the brain are very fully discussed. Some of the dissections showing the course and relations of the nerves are beautiful. The two final chapters on the development of the eyes and on comparative anatomy open up a wide field. The printing and general get up of the book leave nothing to be desired. We commend it as a valuable acquisition for ophthalmic surgeons.

Questions cliniques d'actualité

3e Série. By Many Authors. Paris: Masson et Cie. Pp. 302. Fr.45.

THIS collection of lectures delivered at the Charité Hospital in Paris, under the direction of Prof. Sergent, includes discourses on some 20 subjects by well-known authorities. In general the addresses are of the post-graduate type, but a few of them are of more interest to the specialist than to the practitioner. F. Bordet gives a useful account of the association of influenza and tuberculosis; R. Boulin reviews the use of insulin in diabętes; and P. Jacquet contributes an admirable lecture on chronic appendicitis. Of more specialised interest are the chapters on pulmonary syphilis (J. Dechaume), carcinoma of the supra-renals (L. Langeron), and hypertension of congenital syphilitic origin (J. Genevrier). N. Fiessinger gives a particularly interesting study of some of the more obscure forms of amœbic abscess of the liver, and the brilliant results obtained by the use of emetine in treatment. Among the less practical addresses is the general review of cancer research by G. Roussy. At the present time when many teaching hospitals in this country are organising a short post-graduate course every year the method of approach and choice of subject matter by French physicians and surgeons is noteworthy; while at the same time the clear style and authority of the contributors makes this an important expression of present-day French teaching. Such a collection of post-graduate lectures delivered at a famous hospital has a particular interest to those in other countries, and Prof. Sergent and the publishers are to be congratulated on making available such a volume as this. It is an example which on occasion might perhaps with advantage be followed in this country.

The Sanitary Inspector's Handbook

A Manual for Sanitary Inspectors and other Executive Public Health Officers. By HENRY H. CLAY, F.R.San.I. London: H. K. Lewis and Co., Ltd. 1933. Pp. 406. 15*s*.

THE mansion of preventive medicine has been enlarged during the last 30 years to include so many varying activities that the medical officer of health may forget that correct sanitation—using the term in its widest sense—is still the foundation on which it must be built. In rural areas indeed sanitation remains one of the main activities of the public health service, and Mr. Clay's excellent book will enable the medical officer of health to keep abreast of the latest developments in sanitation and to meet his inspectors on equal terms. Mr. Clay's experience as a lecturer at the London School of Hygiene and Tropical Medicine and at the Royal Sanitary Institute has enabled him to fill the needs of students reading for the D.P.H. and, as Prof. W. W. Jameson says in his introduction, the correlation of the legal and practical aspects of sanitation is admirably arranged. The illustrations could hardly be bettered, and the sections on nuisances, the "one pipe system," and disinfection are worthy of special mention. Where Acts are quoted at some length verbatim, as under the various Milk and Food Regulations, it would have been helpful to emphasise important points and clauses in heavy type; and an occasional indication of the extent to which Adoptive Acts and By-laws are in force would have been of interest. We have surely not yet reached the point in heating when a coal fire is not even worthy of mention; nor is the low-temperature panel system of radiation quite as perfect as heating engineers seem to think it. One or two minor slips should be corrected in the next edition. The index contains no mention of the Knapen system of wall ventilation referred to in the text, nor of "grease-traps." The useful glossary of building terms might well include definitions of "reveal," "hardcore," "sleeper walls," and "invert," all referred to in the text.

Minor Maladies and their Treatment

Sixth edition. By LEONARD WILLIAMS, M.D. London: Baillière, Tindall and Cox. 1933. Pp. 420. 10*s*. 6*d*.

WE are glad to think that examination papers are not nowadays concerned only with the rarities of medicine, so that the student cannot afford to ignore minor maladies. The more interest he has taken in such ubiquitous and often intractable disorders as "indigestion," constipation, colds, rheumatism, headache, the more he will welcome useful practical advice in "Minor Maladies" born of experience. In this edition a new chapter on salient symptoms has taken the place of one on goutiness. It includes as "some of the most outstanding symptoms of the gouty diathesis" albuminuria, glycosuria, "blood pressure," obesity, boils, warts, baldness, acne, heat-stroke and sunburn, insomnia and sneezing! The chapter on minor glandular insufficiencies contains a number of generalisations, such as "unsatisfactory babies are almost invariably the subjects of thyroid deficiency." Dr. Williams blames such deficiency for most cases of enuresis, as well as for cases of night terrors, adenoids, enlarged tonsils, and enlarged lymphatic glands in children. Generalisations must be dogmatic; they are apt to be too dogmatic. Chapter 8 on advancing years is entertaining and full of illuminating quotations. The author's views upon tobacco are perhaps deliberately left obscure; the recommendation that everyone over 55 years of age should stop smoking would probably be taken more seriously if the interdiction was not extended to people of any age, those with supernumerary nipples or with red hair. Dr. Williams seems sometimes to mix the rôle of farceur with that of mentor so effectively that he has deceived himself, and hardly knows when he is deliberately mocking the serious reader and when he is clothing accepted doctrine in an original and striking guise. In all his moods he is entertaining and readable, and no student or practitioner will regret having bought this book.

THE LANCET

LONDON: SATURDAY, JULY 8, 1933

THE VIRUS OF INFLUENZA

MANY attempts have been made in the past to transmit influenza to animals. Most of these have given entirely negative results, but occasional findings with some of the lower apes have raised hopes only to be dashed when the experiments could not be repeated. There always remained the human volunteer, and the experiments of NICOLLE and LEBAILLY (1918), and the successful human transmissions reported in the following year by YAMANOUCHI, SAKAKAMI, and IWASHIMA pointed to the possibility of investigating influenza in this way. But there are manifest drawbacks to the use of human volunteers as the experimental animal for this disease. Not the least of these is the fact that a fatal end to an attack of influenza is not unknown; and although it may be perfectly true to say that uncomplicated influenza is devoid of this risk, who is going to guarantee that the transmitted disease will remain uncomplicated? No one could contemplate the transmission of influenza to human volunteers without misgivings. Meanwhile problems of the utmost importance await solution, of which the most obvious are: the nature of the prime cause of influenza, whether a filtrable virus or the influenza bacillus so constantly present in this disease; the possibility of more than one virus being responsible for clinical influenza; the relationship of the causal organism of influenza with that of the common cold. The desire for a laboratory animal, inexpensive to buy and to maintain, which would be susceptible to the virus of influenza must thus have distorted the dreams of most workers in filtrable viruses, for it has long been realised that such an acquisition would open up wonderful new ground for investigation.

It is almost impossible therefore to over-estimate the importance of the discovery, described elsewhere in this issue, that the ferret is susceptible to infection with human influenza. The simple account given by WILSON SMITH, C. H. ANDREWES, and P. P. LAIDLAW of their successful attempt to transmit influenza to laboratory animals makes a fascinating story. Taking advantage of the epidemic of the disease which occurred at the beginning of this year, they tried to infect many different species of animals, using filtered throat-washings obtained from patients as early as possible after the onset of symptoms. Negative results were obtained until they tried infecting ferrets which, two days after the nasal instillation of filtered throat-washings, became ill with fever and nasal catarrh. Transmission from ferret to ferret by means of suspensions of nasal mucosa were successful; in fact, with one strain 26 serial passages have been carried out. Quite early in this work with ferrets it was found that the disease passed from ferret to ferret by contact, so the investigation was moved from the laboratories of the National Institute for Medical Research at Hampstead to the Institute's farm laboratories at Mill Hill, where the régime of rigid isolation evolved for the previous work with distemper could be applied. In all, throat-washings from eight human patients have been tested on ferrets, and five of these proved infective. Animals which had recovered from the infection were found to be solidly immune to reinfection and their serum neutralised the virus. Of the many interesting side-issues of their work, the comparison which the authors have been able to make between their virus and the swine influenza virus of Shope is worthy of special notice. This virus was isolated by Shope from a disease of swine which arose spontaneously during a time of epidemic influenza in America. By itself Shope's virus produced a mild and transitory illness, but when associated with a bacterium, *Hæmophilus influenzæ* (*suis*), indistinguishable from Pfeiffer's bacillus, the complete picture of swine influenza was obtained, Shope's virus was shown to be infective for ferrets, but what was more interesting, a quite considerable cross-immunity has been found to exist between it and the recently isolated human influenza virus. This cross-immunity was not quite complete, for although recovery from the swine virus gave solid immunity to the human virus, animals recovered from infection with the human strain were not completely immune to the swine virus. These findings, however, indicate clearly enough a close antigenic relationship between Shope's virus and the human influenza virus, and open up the interesting possibility of swine contracting influenza from man.

Needless to say all this work has been most carefully controlled. The presence of cultivable bacteria in the infective filtrates has been excluded, and it has been shown that the filtered washings from the throat of four normal individuals and one suffering from a common cold were incapable of producing disease in the ferret. When it is added that the serum of human convalescents neutralises the virus the story is complete. Although the authors show great modesty in drawing conclusions from their work, there seems little doubt that they have succeeded in transmitting influenza to ferrets, and, if they have not finally settled the long controversy between the protagonists of Pfeiffer's bacillus and those of a filtrable virus, they have offered almost conclusive evidence that the primary cause of human influenza is a filter-passing virus.

THE TREATMENT OF ANÆMIAS

THE anæmias most commonly met with in general practice are those due to a deficiency of one or more of the essential hæmopoietic factors. Such deficiencies can readily be relieved by appropriate therapy. There is, however, to-day "much wastage both of material and of human efficiency and life," as was made clear in an

important series of papers read at the summer meeting of the Association of Clinical Pathologists and printed in full on another page. This wastage, which is preventable, is to a large extent dependent upon two factors: (1) failure to appreciate the necessity of pathological investigation in diagnosis and in controlling subsequent treatment; (2) failure to prescribe adequate amounts of certain anti-anæmic preparations owing to the absence of any indication of their therapeutic potency. The differential diagnosis of various forms of anæmia can in many instances be made only after a somewhat elaborate pathological investigation, as Dr. S. C. DYKE makes clear, and owing to incomplete diagnosis many patients receive treatment as useless as it is expensive. Since the deficiency in most of the anæmias which affect adults is dependent upon some permanent abnormality, treatment must be continued indefinitely. Moreover the personal variability in the response to anti-anæmic factors renders the laboratory control of both initial and maintenance treatment essential. Dogmatic statements on dosage of anti-anæmic principles are thus misleading. The satisfactory dose for any patient can only be determined by controlled treatment. This applies, as Dr. JANET VAUGHAN said, in the course of the animated discussion reported on p. 63, to the use of iron in various forms of hypochromic anæmia as well as to liver or its substitutes in hyperchromic megalocytic anæmias. Difficulties as great have been met in the widespread development of insulin therapy, where the dosage also has to be checked by the response of individual diabetics. Here, however, it has proved possible by laboratory control to establish dosage within certain limits, and massive insulin-medication irrespective of response is now almost obsolete.

The resolution passed by the Association of Clinical Pathologists, urging the establishment of centres at which laboratory service would be available to patients with anæmia under the national health insurance has our cordial support. And if, as may be hoped, the voluntary hospitals are entrusted with this work the arrangements made for the treatment and investigation of insured patients will be available also for others. Centres organised for periodical laboratory service would moreover be admirably adapted to undertake the methodical and controlled assessment of the potency of various liver and stomach preparations which is now so badly needed. At present clinical trial is the only available method of assaying potency. It is clearly not an ideal method, but since there is no reliable alternative it must be employed. Most liver preparations are now supplied in units said to be equivalent to the amount of liver from which they are prepared. This definition is adopted in the recent issue of the British Pharmacopœia. It is generally agreed that potency is lost in extraction, but it does not seem to be generally recognised that extracts made from a certain weight of liver have not the therapeutic value of that amount of liver when it is ingested as cooked food. Some patients are in consequence receiving inadequate amounts of the anti-anæmic principle. The several extracts made by different firms also vary in potency; this variation is in part dependent upon the methods of extraction used and in part on unknown factors. It emerged, however, from last week's discussion and from that held some months ago on the same subject at a meeting of the Royal Society of Medicine, section of therapeutics and pharmacology,[1] that certain extracts are generally more potent and more reliable than others on the market. These are not necessarily the most expensive; the price apparently has no relation to the therapeutic efficiency of the product. There is much clinical data scattered in hospital and private records which should make it possible to determine with some degree of accuracy the therapeutic potency of different preparations. Even an approximate indication of the average optimum dose of different products would be more valuable than a knowledge of the amount of liver from which they were prepared.

The time has clearly come for a scientific body, e.g., the Medical Research Council, to arrange for the collection and correlation of the information now possessed which was not yet available when the B.P., 1932, was being prepared. It should be possible not only to assess, at least approximately, the average therapeutic potency of different extracts but to determine the most satisfactory methods of administration. It is, for instance, now generally accepted by workers treating large numbers of patients suffering from Addisonian pernicious anæmia that of the universally applicable forms of "maintenance" treatment, weekly or even monthly administration of certain intramuscular preparations made from small quantities of liver is the cheapest and most efficient. This method has the further advantage that it is known to reach the patient himself, instead of being distributed, as a dish of liver might be, round the family dinner table. It is not by any means at all hospitals that "maintenance" out-patients receive parenteral therapy; but the figures worked out by Dr. DYKE supply evidence which is likely to popularise this form of treatment on grounds of economy as well as of efficiency. In private practice the position is less simple unless patients can be taught to overcome their dislike of periodical injections. Moreover, the cost of a weekly visit to a doctor would to some extent cancel the economy effected, and certain patients do not readily acquire the habit of self-injection without anxiety. Another outcome of a careful attempt at assay might well be an increase in the potency of extracts designed for oral administration, though failure of absorption within the gastro-intestinal tract must always be a factor to be reckoned with. Manufacturers have always been alert to profit by expert help in perfecting their biological products and have shown remarkable promptness and adaptability in applying the results of controlled investigations. They would

[1] See THE LANCET, 1933, i., 84.

undoubtedly welcome any further attempts to determine and standardise the potency of extracts. As Dr. GREENFIELD points out, the question of the relation of the deficiency causing anæmia to the lesions of subacute combined degeneration is another question which requires further study. It is still open to doubt whether all anti-anæmic remedies are equally effective in relieving nervous symptoms. Even approximate information of the therapeutic potency of liver and stomach extracts and of the most reliable methods of their administration, combined with facilities for controlled treatment, should do much to reduce the present unnecessary wastage of life and of scientific material.

SERUM IN PNEUMONIA

As long ago as 1891 G. and F. Klemperer prepared an "antipneumotoxin" by injecting filtered sputum into rabbits. The immune serum they obtained was found to protect a rabbit against subsequent inoculation with pneumococci and was tried in a few cases of pneumonia. By the beginning of this century Foa and Scabia, Jansson (1892), Washbourn (1897), Parr, Biggs, Pane (1897), Tizzoni and Panichi, Römer (1902), and Lambert had independently made efforts to prepare sera from different animals, such as the horse and the ass, immunised against the pneumococcus. Pane's antiserum seems to have undergone the most extensive tests, but the results with all of them were uncertain. Among others Neisser, Marchoux, and Weissbecker attempted to combat pneumonia with the serum of convalescents, but here again the results were doubtful and the treatment of the infection with immune sera remained a tantalising problem for the immunologist. Between 1909 and 1912, however, the pioneer work of Neufeld and Händel laid the foundation of the subsequent American investigation of the different pneumococcal types, whose existence is now well established.

The use of the polyvalent sera hitherto employed now gave place to more accurate attempts to produce immunisation against one or other of types I., II., and III. Most of the first advances in this direction were made at the Rockefeller Institute for Medical Research in New York, where it was soon discovered that an antiserum to type I. strain offered the best prospect of success. The early results were summarised in a monograph on acute lobar pneumonia written from the Institute by Avery, Chickering, Cole, and Dochez in 1917 with a view to placing the knowledge, thus available, at the disposal of army medical officers who were faced with large numbers of susceptible recruits brought together in camps during the winter months. From that time onwards investigations have been almost continuous. The method of preparing the serum, as described in 1917, was by immunisation of horses with a strain of pneumococcus virulent enough to kill a mouse in a dose of 0·000001 c.cm. For purposes of standardisation new means had to be devised because no pneumococcal toxin had been demonstrated and the method used for diphtheria and tetanus antitoxin was therefore inapplicable. The investigators fell back on the plan—followed by Eyre and Washbourn and others many years previously—of using the bacteria themselves instead of their toxin, and ultimately a standard of potency was adopted in which only those sera were selected for therapeutic use which, in doses of 0·2 c.cm., protected mice against 0·1 c.cm. of a standard culture. On this basis a dose varying from 80 to 100 c.cm. was employed for therapeutic use.

Meanwhile attempts were being made to obtain concentrated sera. Huntoon, in 1921, had devised a method of absorbing antibody from antipneumococcus serum with homologous living pneumococci, and recovering the antibody by washing the cocci with weak alkaline saline, and later, in 1925, Felton prepared the concentrated serum which has taken such an important place in modern serum therapy. He precipitated his immune substance from antipneumococcus serum by diluting with water or weak acid solution and redissolving in salt solution. Other concentrated sera have followed, though Felton's has been tried most widely, and sufficient data have been accumulated to encourage immunologists to persevere in the improvement of methods of production. Dr. Cruickshank in the Milroy lectures, lately published in our columns, produced figures for the mortality of cases treated with and without serum in the United States and Great Britain. In type I. a mortality of 17·3 per cent. is given for 547 serum-treated patients as against 31·0 per cent. for 477 untreated; in type II. a mortality of 33·4 per cent. is found in 415 treated as compared with 43·3 per cent. in 367 untreated. But, as Cruickshank points out, too much stress must not be laid on mortality-rates. Amelioration of symptoms and shortening of the period of infection have also to be considered, and it is noteworthy that his temperature charts of a consecutive series of serum-treated patients show a definite shortening of the infection in type I. and a less definite in type II. cases. Broadly speaking, future progress is impeded by three sets of obstacles—clinical, commercial, and immunological. On the clinical side it is often difficult to get cases early enough for serum treatment, and it is not yet generally appreciated that time is as important here as in many surgical emergencies. There are also anaphylactic difficulties to be overcome and the lesser difficulties attendant upon all intravenous medication, whilst useful immune sera are only available for types I. and II. pneumococcus infections. Added to these drawbacks is the necessity for bacteriological typing which requires time and skill, and sputum is not always available for the purpose. To use type I. serum, for instance, in a type III. or group IV. infection is tantamount to administering normal horse serum, and nothing more; and as Dr. G. L. LANGLEY points out on another page, to give serum where it is fundamentally unsuitable will do the patient no good and will bring the preparation into disrepute. On the commercial side these sera are costly to produce, and

the expense works out at several pounds per patient over a series of cases—no small item for a hospital in these hard times.

There are many problems too on the immunologist's side. In an article on p. 91 of this issue, Mr. Percival Hartley, D.Sc., and his medical collaborators emphasise the important point that some of the failures of the past have been due to the lack of a common standard of reference with which to compare the various serum preparations used clinically, and until one standard serum is available in terms of which all others may be assayed, the labelling of preparations in terms of arbitrary "units" may be definitely misleading. Moreover it has long been recognised that a serum which has a powerful protective action in mice and other laboratory animals may have less action, relatively, in clinical practice, and there is no analogy between the antitoxic serum of diphtheria and the antibacterial serum of pneumonia. The first section of the report describes how Dr. Hartley and Dr. Wilson Smith, at the National Institute for Medical Research, prepared a dry standard antipneumococcus serum, type I. This dry preparation can be "reconstructed" in the form of a glycerol solution and issued to laboratories as a standard control. In this way it was possible for Dr. G. F. Petrie and Dr. W. T. J. Morgan at the Lister Institute and Dr. H. J. Parish and Dr. J. W. Trevan at the Wellcome Physiological Research Laboratories to make control tests as to the relationship between the "reconstructed" serum and the pooled liquid serum F. 146 (kindly given by Dr. Lloyd F. Felton of the Harvard University Medical School) and to compare their results with those obtained by the issuing laboratory at the National Institute of Medical Research. The results of these comparative tests show a definite measure of agreement. It is proposed therefore that, pending the definition of a unit by international arrangement, the unit originally proposed by Dr. Felton should be provisionally adopted as the basis of measurement for antipneumococcus serum type I. Such a unit is equivalent to 0·0886 mg. of the dry standard preparation, and all samples of antipneumococcus serum type I. of unknown potency can in the future be assayed in terms of Dr. Felton's original liquid antiserum. The advantages of this great step forward are obvious, and will go far to overcome the difficulty of estimating adequate dosage to which Dr. Langley draws attention (see p. 70). In future it will be possible more accurately to compare one serum with another and one of the bugbears of the serotherapy of pneumonia will now, it is hoped, be banished.

ANNOTATIONS

THE BRISTOL MEDICAL SCHOOL

THE Bristol Medical School, now merged in the medical faculty of the University of Bristol, was celebrating its centenary at the end of last week, and the opportunity has been taken to issue an informing history of the school, written by Dr. George Parker. The school had its origin in the founding of the General Hospital in 1832 at a time of great expansion in Bristol, and it developed from a group of pupils, who, serving in rotation as resident dressers, were in a sense apprenticed to the medical staff of the hospital. These formed a school round the new General Hospital. There was in existence already a medical school in the city which had obtained official recognition from the Royal College of Surgeons of England; the Bristol Infirmary was attended steadily by dressers; and there were also lecturers in the city, whose certificates to the competence of students were accepted by examiners both at the College of Surgeons and at the London Society of Apothecaries. In 1833 a combination of the various groups was effected and from that date onwards Bristol has possessed a strong medical school. Now Dr. Parker tells the story of the development of this school in detail, describing in a very readable way its affiliation with Bristol College, its acquisition of buildings, its good fortune in attracting great teachers, and its incorporation in the University of Bristol. The book has many excellent illustrations of old and modern Bristol, and the cost of publishing it has been defrayed as a centenary gift by the well-known medical publishers, Messrs. John Wright and Sons.

The various functions and receptions in connexion with the centenary were fully attended. At the memorial dinner held in the University Union an apposite speech was made by Sir Holburt Waring in proposing the toast of the school. He found that at Bristol there were, in the arrangements of hospitals and the instruction thereat, opportunities offered for the kind of fusion which should get the best out of university medical education—a fusion of the clinical with the academic. At the official luncheon, also held at the University Union, Lord Dawson, from a different point of view, laid much the same stress on the value of adjustment at the centres of medical education. He pointed out that medicine had so grown in scope that the branches might overweigh the trunk, while every year a new subject was added to the already full curriculum. The necessary adjustment could be made, he said, by making the branches of the profession take their proper place as knowledge to be acquired when the basic subjects of medical education have been mastered. All concerned in the affairs of the University must have been proud of the occasion, and special congratulations were more than once offered to Prof. E. Fawcett, F.R.S., who has been dean of the medical school for 40 years.

EFFECT OF RADIUM ON EYE STRUCTURES

SPEAKING of treatment by radium at a meeting of the section of ophthalmology of the Royal Society of Medicine on June 9th, Dr. Roy Ward said that the conjunctiva and eyelids were the most susceptible of the ocular structures to radium, the globe being comparatively radio-resistant, excepting the lens. The onset of cataract as a sequela to irradiation might be quite remote in time. Most of the eye conditions for which radium was applicable needed only surface applications, and no great penetration was desirable. Prolonged gamma radiation, particularly by means of surface moulds, was likely to lead to permanent damage, and, given good sight and the globe in a good position, should be avoided. Lesions

of limbus, conjunctiva, and cornea were treated solely with beta radiation, which was quite absorbed by half a millimetre of platinum, while over 90 per cent. of the gamma radiation penetrated such a screen. Hence for beta radiation a very thin screen was used. Exact localisation was all-important, and some device was needed to retain flat applicators in the precise position required. The eye was cocainised, and the posture of the patient must be a relaxed and comfortable one, the gaze being kept fixed at one spot. It was advisable to have the patient under the supervision of a nurse to prevent the eyes from wandering. The common tumours of the conjunctiva and cornea were epithelioma and melanoma. Usually these were small when first seen, and removal of a portion for microscopical examination was contra-indicated, as it involved great liability to spread. Generally epithelioma arose near the limbus, and this situation favoured the use of beta radiation, owing to the ease of retaining applicators in position. The duration of the sittings varied between 45 and 65 minutes, and usually the following reaction was not severe; it occurred in 10 to 14 days after the exposure. The full effect was not apparent for six or eight weeks, and if at the end of that time the lesion had not disappeared the treatment could be repeated. Melanoma of the conjunctiva was of less frequent occurrence, and usually it had a pre-existing nævoid base. The treatment was the same as for conjunctival epithelioma. Primary tumours of the cornea were very rare; those dealt with at the Radium Institute had reacted well to the same treatment. Mooren's ulcer of the cornea was much more difficult to treat by irradiation, and the prognosis was grave. Though the results were not uniformly good, radium treatment with a safe dose, for 45 to 50 minutes, had been encouraging; if necessary, further treatment could be given at the end of six weeks. In spring catarrh, which was intractable to ordinary treatment, distinct benefit, with about 40 per cent. of cures, had been obtained from repeated applications of unscreened radium to the conjunctival surface of the upper lid. Cavernous nævi and raised capillary nævi, especially at an early stage, were suitable for radium (slightly screened) applications, but not the "port-wine" variety. Improvement was seen about six months after the last exposure to the radium; if excessive exposure was given, telangiectases were liable to appear. Papillated or filiform papillomata could usually be cured by unscreened applications in 1 to 1½ hours. During the last few years 20 pitch-warts had been treated at the Radium Institute. Dr. Roy Ward also discussed radium treatment of malignant growths of the eyelids and rodent ulcer. The treatment of glioma of the retina was primarily surgical, and choroid sarcomata and other tumours growing from less accessible parts of the orbit were not suitable for radium applications as a primary measure.

In a note on the effect of irradiation on the eye appended to the report of the radiological registrars of University College Hospital for 1932, the ophthalmic registrar, Mrs. Philippa Martin, F.R.C.S., discusses in some detail the reactions observed under radium treatment of orbital and extra-orbital tumours. The conjunctival reaction to radium is one of œdema and hyperæmia, and reaches its maximum about the sixth day after insertion of the needles. It is usually accompanied by a muco-purulent discharge of which the bacteriology is being investigated. Where radium needles are placed in close apposition to the conjunctiva a scar is formed. Contraction and thickening follow after some months. Epiphora occurs either from cicatricial ectropion or from obliteration of the punctum lacrymale by the scar. Several cases of iritis were observed, but no signs of accompanying cyclitis. The reaction was immediate and showed no tendency to relapse. One of these cases developed a cataract which became mature 28 days after insertion of the radium; in two cases cataract developed after 18 months. No effect on the retina or optic nerve has so far been observed. Corneal ulceration, in two cases severe, has followed irradiation by radium in four cases. The cases so far examined are few. Mrs. Martin put forward certain tentative suggestions as to the probable effect on the structures of the eye of irradiation applied to tumours in its neighbourhood: (1) The smaller doses, such as are used for basal-celled carcinoma, even if repeated, produce an effect which is limited to the conjunctiva —e.g., contraction, epiphora, and loss of eyelashes. (2) Repetition of a dose of radium which ordinarily produces no damage to the eye may be followed by severe destructive effects. (3) The dose of radium which can be applied to an eye without permanent damage is not constant, but varies with individual tolerance. (4) No effect has so far been observed on the other eye, probably because the ethmoid provides an adequate screen.

SERUM TREATMENT OF ACUTE POLIOMYELITIS

THE Medical Research Council announce that, after discussion with other bodies concerned, it has been decided to issue a supply of serum obtained from patients convalescent from acute poliomyelitis, with a view to its trial in the treatment of the pre-paralytic stage of the disease. The Council state that encouraging reports on the results obtained by this treatment have been received from Australia and Canada, but adequate data are still needed to confirm its value, particularly in view of doubts which recent experience in America has cast on the reliability of the basic data. With the coöperation of several hospitals, a limited supply of "convalescent" serum has already been obtained and prepared for issue at the Lister Institute (Department for the Preparation and Study of Antitoxic Sera), Elstree, Herts. The main stock of this serum has been deposited at the Western Fever Hospital, Seagrave-road, London, S.W. 6 (Fulham 2105), where suspected early cases will be admitted for observation and treatment in the preparalytic stage, and whence supplies of serum may be obtained by other hospitals and practitioners in the London area for use in appropriate cases. When the quantity of available serum is larger, it is hoped also to be able to send supplies to different provincial centres.

With a view to increasing the stock, practitioners and public health officers who know of convalescents, or groups of convalescents, willing to be bled are earnestly requested to communicate with the Lister Institute, Elstree, Herts. Arrangements could then be made to supply apparatus for the collection of serum, or, if circumstances permitted, to send a worker to perform the actual bleeding. The serum will be supplied gratuitously on the understanding that the case-record forms enclosed in the cartons shall be completed and sent for collation and analysis to the Medical Research Council, 38, Old Queen-street, London, S.W. 1. It is regarded as essential that the administration of the serum should only be done by a medical practitioner or pathologist who is experienced in the technique of lumbar puncture and intrathecal injection. The serum is issued in outfits each containing 4 × 25 c.cm. ampoules, or

sufficient serum to complete the treatment of a single case, and full particulars of mode of administration and dosage are contained in the cartons.

Owing to the limited stock of serum at present available it is particularly requested that the treatment shall be used only in the *preparalytic stage of the illness*, or exceptionally in a pyrexial phase when the symptoms indicate a rapidly progressive invasion of the spinal cord as shown by extension of the paresis or paralysis. The serum should on no account be used in the post-febrile stage when the infection has become quiescent and paralysis is established; the evidence does not support its employment in this stage. The attention of physicians using the serum is called especially to the "Memorandum on Acute Poliomyelitis," issued in 1932 by the Ministry of Health, and obtainable from H.M. Stationery Office.

THE BED-BUG

By the fouling of articles with excreta, by its objectionable smell, and above all by the irritation of its bite, the bed-bug, though not known to carry disease, displays itself as a pest whose relative importance is increasing. Not only is it present in a surprisingly high proportion of old houses in this country, but the public health authorities are faced with a serious practical problem in the infestation of new houses, chiefly by way of the furniture and pictures of tenants coming from slum areas. With the idea of throwing light on the problems involved and of bringing together those who meet the insect in its field and those who study its habits in the laboratory, a joint meeting of the metropolitan branch of the Society of Medical Officers of Health and of the Sanitary Inspectors' Association was held on June 29th last at the London School of Hygiene, with Prof. W. W. Jameson in the chair. Dr. V. B. Wigglesworth, of the department of entomology at the School, gave an illustrated outline of the life-history and habits of the bed-bug, emphasising the fact that it can live more than 40 weeks without food, and that changes in temperature and humidity have little effect on its well-being. Prof. J. W. Munro and Mr. A.P.B. Page, Ph.D., of the Imperial College of Science, described their research into problems of disinfestation of goods in warehouses. By ingenious methods a chemical control of the concentrations of various fumigants such as ethylene oxide, and cyanic acid gas was obtained, and thus a knowledge of what exactly happens when these gases are liberated was obtained for the first time. Several important facts emerged. Thus it was shown that unless some form of mechanical stirring of the air was adopted the concentration of gas was almost nil at rafter level, but that if a simple punkah system was used during the liberation of the gas the concentration was uniform throughout the building. In general the conclusion reached was that the resistance of insects had been greatly underestimated in the past and that, especially at temperatures below 50° F., very much higher concentrations were required than were usually given.

In the ensuing discussion, a somewhat pessimistic attitude was taken up by most of the speakers who had had practical experience of house disinfestation. The London County Council have had 97 per cent. of successes with some 300 houses over a period of nine months with HCN gas, but apart from the very high cost the tenants of adjoining houses have to be dispossessed for 12 and often for 24 hours. Dr. C. F. White, of the Port of London sanitary authority, emphasised the dangers of cyanide fumigation, and stated that it had been generally prohibited in France. Most of the sanitary inspectors seemed to be of the opinion that only stripping woodwork and direct spraying were of use, and varying views were expressed as to the relative merits of certain patent insecticides, views which might be explained by Prof. Munro's suggestion that each product varied in its potency from time to time, and that there should be a guarantee of stable composition. The value of efficient "sealing" was also emphasised, and the fact that the smaller the building the greater was the "leak" effect. A portable apparatus for vacuum fumigation of furniture and pictures was suggested, but the general opinion seemed to be that "the bug wins all along the line." In reviewing Major E. E. Austen's British Museum pamphlet on August 13th last year we mentioned the possibility of utilising some of the natural enemies of these insects for their destruction; but as things are at present Dr. Killick Millard was perfectly right when he pointed out (Sept. 3rd) that few people would welcome the introduction of cockroaches, red-ants, or even hook-scorpions into their houses on the chance that they would wage war on bugs.

Proper control of the qualifications of men engaged in fumigation, education of public opinion, and, above all, further research—which cannot fail to pay for itself many times over in the long run—are clearly demanded if anything more than tinkering is to be done in the matter.

ANEURYSMS OF THE SINUS OF VALSALVA

Until the last few years the diagnosis, during life, of aneurysm involving the intrapericardial portion of the aorta (aneurysms of the sinuses of Valsalva) was thought to be difficult or impossible. Of four cases of this type lately recorded [1] one is an instance of forward projection of the sac, and in another it extends to the left. Both of these were accompanied by clinical signs suggesting aneurysm—namely, expansile pulsation and a positive Wassermann reaction, and confirmation was given by radioscopy. In the second case the sac could be seen to arise from the first part of the aorta and formed a prominence distinct from that of the pulmonary artery; but it may not always be possible to distinguish aortic aneurysms in this situation from aneurysms of the pulmonary artery, though pulse changes indicating aortic insufficiency would of course be strong evidence in favour of the former. It is to the right, however, that such aneurysms are most frequently found to extend. Here the sac may project upwards or downwards and a differential diagnosis has to be made from mere tortuosity or cylindrical dilatation of the ascending aorta, when the direction is upwards. Most significant is the demonstration on the screen of a pocket which appears grafted on to the shadow of the ascending aorta. Greater interest attaches to aneurysms developing to the right and downwards in that they occupy a quite unusual part of the cardiac shadow, and there is a risk of misinterpretation or of non-recognition. There are three clinical signs of such an aneurysm: pulsation in the fourth or fifth intercostal space; pain in the right side of the chest; and a double aortic murmur having its maximum intensity at the inner ends of the fifth and sixth right intercostal spaces. On radioscopy the appearances may suggest at first sight an enlarged right auricle or even a greatly dilated left auricle. On close examination, however, the separate arcs of the aneurysm and of the right auricle may be

[1] Lian, C., Marchal, M., and Deparis, M.: Bull. et mém. soc. méd. hôp. de Paris, May 8th, p. 522.

distinguished, not only by their shape but also by the asynchronism of their movements. Finally, strong evidence for the aortic origin of such a shadow will be any sign of calcification in its border.

TELEPATHY ON TRIAL

ON March 25th we drew attention to a test of telepathy in which readers of the *Scientific American* were asked to participate. The test was simple though somewhat laborious. It merely consisted of two persons making 500 throws with an ordinary die. The "transmitter" was instructed to look at the number thrown each time and to "concentrate" upon it; the "percipient," who was to be blindfolded, was required to state the number, his statement being recorded, without comment, as right or wrong. When a reasonably large number of such sets had been returned by enthusiastic readers, the number and distribution of correct answers could be compared with that expected on the theory of chances. We suggested that the working out of this chance distribution might prove more difficult than may seem at first sight owing to the fact that ordinary commercial dice are not invariably true, but sometimes tend to record an excess of high numbers. If the "percipient," consciously or unconsciously, tended to guess high numbers rather than low numbers the frequency of success would, then, certainly be greater than that expected on the theoretical chance basis adopted. The *Scientific American* (July, 1933, p. 10) has now made an analysis of the first 120 sheets returned, the general conclusion being that the results show significant divergencies from the chance distribution, and that certain of the findings must be followed up for further and more comprehensive study. The expected number of correct guesses in 500 throws is 83; on the 120 sheets analysed the observed mean number of correct guesses was 93. The difference is relatively slight, but with 60,000 throws the probability that it has arisen by chance is very small. The highest number of successes recorded was 223, so that apparently "telepathy" at its best could not secure a correct answer in as much as 50 per cent. of the trials—that is excluding the gentleman who purported to have been correct every time, adding modestly that he could speak to each and every person in each and every part of the world by mental telepathy. Needless to say his form was rejected; but can we be sure that in other cases recording an abnormally high percentage of successes there has not been some violation of the rules, and not necessarily a conscious violation? Some notes on the ten charts of highest record reveal the fact that eight of them are the work of one pair of experimenters. To include an unequal number of tests from pairs of participants seems to be an illogical procedure which makes the frequency distribution of successes difficult to interpret. If the eight tests by this one pair be excluded the observed mean number of successes in the remaining 112 becomes 85·6, a value which differs insignificantly from the expected value of 83·3. Further, it is recorded that the percentage of successes rose in these eight tests by Mr. and Mrs. S., as the experiments went on from day to day, from 29·4 per cent. in the first 500 to 44·6 per cent. in the last, and that sometimes the work was better in the early part of a group of throws but more frequently it was better later. Is this the way in which telepathy works? Does it improve with practice? It is a curious phenomenon. Can we be sure that the die used was always true, that no number-guessing habit was formed which would correspond with a bias in the dice, that the percipient had no knowledge of past experience except the crude percentage of right and wrong, recorded *without comment*? So far this trial of telepathy merely leads to the conclusion that there are a number of observations recorded which are not likely to have arisen by mere chance. *How* they have arisen is the problem for the promised "further and more comprehensive study." An evening's dice-throwing by husband and wife, or fellow students at college, is not going to lead to scientific evidence of causation; only further controlled experiments can throw any light upon that. If the results of these further experiments warrant they will be reported, it is stated, in the pages of the *Scientific American*. It is sincerely to be hoped that the conditional clause ("if the results warrant") does not imply that negative results will go unreported. The dice-throwing experiments are sufficient to whet the appetite; it would be still more interesting to have an explanation of the abnormally successful "percipients," be it telepathic or not. So far the verdict must definitely be one of unproven.

CHAPTERS IN AMERICAN OBSTETRICS

A COLLECTION of essays on the history of obstetrics in America [1] is certain of a welcome here because the development of medical practice in another country has a special interest for ourselves. Its progress shows what would naturally be expected: dependence on the Motherland, first for ready-made practitioners, then for the training of its own sons sent back to the old universities, later the foundation of medical faculties in the universities of the new country, and eventually complete independence. Except for the opening chapter on the Beginnings of Obstetrics in America, the others are studies of the character and contributions of some of those who have influenced the subject and thus serve to illustrate its evolution up to the middle of the last century.

The first essay demonstrates the West following the East in making the change from the untrained midwife to the medical "man-midwife" in the eighteenth century, save that it seems to have done the business more thoroughly and to preen itself on the completeness of the change. One of the more recent ways of showing conversion from early heresies has been the proscription of the use of the word "midwifery," although of the oldest and bluest English blood, in favour of the new-fangled Latin term meaning exactly the same thing. "Midwifery" has apparently been abandoned in the American language as connoting something inferior to obstetrics and signifying rather practice by midwives. Prof. Thoms would surely have been justified, however, in using the term for the title of his opening chapter, for it is almost wholly concerned with the practice of the midwives of the early colonial days and only touches on the earliest of the "men-midwives." Not only is this appropriate occasion for its use rejected, but aversion is further shown in the succeeding chapter on Samuel Bard, the author of the first text-book on obstetrics published in America, but entitled a Compendium of Midwifery; and again in a later essay on "William Potts Dewes and the First System of Obstetrics," although here also the original title was "System of Midwifery." The transatlantic anathema must be powerful indeed to call for the bowdlerising of old titles. Other chapters consist of essays on John Stearns, who is credited with discovering the use of ergot as an

[1] Chapters in American Obstetrics. By Herbert Thoms, M.D., Associate Professor of Obstetrics and Gynecology, Yale University. London: Baillière, Tindall and Cox. 1933. Pp. 90. 11s. 6d.

ecbolic; on Oliver Wendell Holmes and his famous paper on "Puerperal Fever as a Private Pestilence"; on Marmaduke Wright, who anticipated Braxton Hicks in the discovery of a form of bipolar version; and lastly one of wide interest on Walter Channing and Etherisation in Childbirth.

Prof. Thoms tells these stories of his professional forebears in his own country in a way that makes pleasant and easy reading; they are certain to be instructive to those who may look up the history of the various forms of treatment associated with the names of the old American physicians who professed midwifery before its translation into the higher sphere of obstetrics.

AMIDOPYRINE IN MEASLES

WITHIN the last few years several observers have published their experiences with amidopyrine (pyramidon) in the treatment of measles. M. Loewenthal,[1] who first advocated its use in that disease, holds that this drug, administered at or before the appearance of the rash, acts as promptly in measles as do quinine in malaria and the salicylates in rheumatic fever, causing a rapid fall in temperature, partial or complete inhibition of the eruption, euphoria, and speedy abatement of the catarrhal symptoms. M. P. Borovsky and F. Steigmann point out[2] that there is no general agreement that amidopyrine is a specific in measles. Some believe that it merely acts in the same way as any other antipyretic, and others that it should not be used at all. Borovsky and Steigman report their own observations upon 194 patients suffering from measles. Alternate patients received the drug in doses of gr. 1 for each year, up to grs. 5 three times a day for those above 5 years of age: 95 patients were treated with amidopyrine while 99 served as controls. Its use did not inhibit the eruption in the one case seen in the pre-eruptive stage; nor did it shorten the course of the disease in the others or lessen the incidence of complications. They conclude that amidopyrine is a valuable antipyretic adjuvant, since a greater number of those in the treated group became afebrile on the second day, but that it should not be considered as a specific remedy for measles.

THE DIET OF ANIMALS AND MAN

A SHORTAGE of food affects different kinds of wild animals in different ways. Among mammals the carnivores either get enough, or migrate, or die. Omnivorous or herbivorous animals, on the other hand, will put up with unattractive alternatives to their ordinary diet: if there is no young grass the rabbit will gnaw the bark of alder and holly or even the cast-off antlers of deer. In his Cavendish lecture to the West London Medico-Chirurgical Society at the Kensington town hall last Wednesday, Sir Peter Chalmers Mitchell pointed out that monkeys in the jungle cannot count on a plentiful supply of tomatoes and lettuce, and their alimentary canal is adapted to take a large amount of leaves, shoots, and roots which provide little nourishment in large bulk. When these same monkeys come to live at the Zoo they get cereals and other concentrated foodstuffs, and if these are taken in equal quantities the result is fatty degeneration of the heart. If, on the other hand, they are given small meals they suffer from inadequate peristalsis. Speaking rather as a comparative zoologist than as a medical man, Sir Peter said he thought there was no doubt that the structure of our alimentary canal is not adapted to the food we eat, but to a much rougher diet. The necessity for indigestible bulk was too often forgotten, and when patients were ill they were put to bed on a non-residue diet and had to be purged in consequence. Both primates and carnivora had a tendency to be omnivorous, but apes and men were fundamentally vegetarian just as otters and ferrets were fundamentally flesh-eaters, notwithstanding their readiness to eat carrots or fruit. At the same time Sir Peter admitted that the digestive processes of mammals are much more accommodating than one is apt to think. He spoke of a horse which ran in the Derby (though not in front of its fellows) on a wholly nitrogenous diet, and of the gull that John Hunter fed successfully on grain. He himself had bought a hyrax—the coney of the Bible, which lives a purely vegetarian life in the deserts of Palestine—from a sailor who had fed it exclusively on fish. The Zoological Society of London, of which Sir Peter is secretary, has found, he said, that with time and trouble there is not much difficulty in hitting on a diet which mammals will take; and instead of sending animals home with inadequate quantities of their natural foodstuffs, donors abroad are urged to get them used to a régime that can be continued on the voyage and in the Zoo. The two gorillas now in residence were brought up on a diet much the same as that of their owners, and still take meat and fish as well as vegetables. The kind of food eaten by a species is of course reflected in the structure of its alimentary canal and the lecturer showed numerous diagrams illustrating the relatively great development of the fore-gut (above the cæcum) in flesh-eaters and the corresponding development of the hind-gut in the herbivora. In many kinds of animal, however, the type of food varies with the stage of life; young nestling birds, for instance, are all carnivorous until they learn better. In mammals, Sir Peter said, three stages can usually be recognised: the infantile, when the diet is milk; the stage of growth; and adult life. The dog at 18 months or 2 years is full grown and thereafter needs only one meal a day. But it seems that certain mammals never reach an adult stage, when feeding slackens—for example, whales, elephants, and perhaps rhinoceroses do not cease at all from active growth—while reptiles not only grow bigger every year, but also miss the tender stage of infancy, and are ready with venomous bites or predatory coils from the moment of emergence from egg or mother.

Sir Peter's address was received with obvious pleasure by an audience which Dr. Julius Burnford, the president, said was unequalled in the history of the Cavendish lecture. Dr. H. H. Mills proposed a vote of thanks and the meeting was followed by a conversazione and by the Society's annual exhibition of instruments and medical preparations.

THE nineteenth annual conference of the National Association for the Prevention of Tuberculosis will be held at Cardiff from July 13th–15th under the presidency of Sir Robert Philip. The main discussion will be on the parts played by infection and environment in the production of tuberculosis.

TWENTY-FIVE permanent commissions in the Royal Army Medical Corps will be offered on July 27th to men under 28 years of age. Particulars will be found in our advertisement columns.

[1] Brit. Med. Jour., 1924, ii., 51; Ibid., 1930, i., 1198.
[2] Jour. Amer. Med. Assoc., June 10th, 1933, p. 1859.

SPECIAL ARTICLES

A PROVISIONAL STABLE STANDARD FOR ANTIPNEUMOCOCCUS SERUM, TYPE I., AND ITS PRACTICAL APPLICATION

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DURING the past few years many clinical trials of serum therapy in acute lobar pneumonia have been carried out, both in this country and in the United States of America. Most of these support the view that serum treatment is of definite value, especially in cases due to infection by pneumococcus, type I.

One of the chief difficulties in making an accurate assessment of the data acquired hitherto is the lack of a common standard of reference with which to compare the various serum preparations used clinically. Methods for the titration of antipneumococcus sera have been evolved, and some of the therapeutic preparations used hitherto have been labelled as containing a certain number of "units." Until one standard serum is available, however, in terms of which all others may be assayed, such labelling can have little value, and may indeed be definitely misleading, as it will remain possible for the clinician to use and the patient to receive a serum of high nominal but low actual potency.

Through the generosity of Dr. Lloyd D. Felton, of the Harvard University medical school, many workers in this and other countries have been provided with a liquid antipneumococcus serum, in terms of which other preparations of this antibody have often been assayed. Antisera in the liquid form, however, tend to lose their specific properties, even when preserved under the best conditions attainable. It appeared to us, therefore, that a dry stable standard preparation of antipneumococcus serum, type I., would serve many useful purposes. During the past three years clinical trials of the serum have been promoted by the Medical Research Council and the Scottish branch of the British Red Cross Society, and are being continued. The value of the data acquired will be greatly enhanced if the potency of the sera from different sources used in the trials and in ordinary practice are standardised on a uniform basis.

With a view to causing as little change as possible in existing practice, the dry standard serum which has been prepared has been assayed, as accurately as the methods at present available allow, in terms of the liquid antiserum supplied by Dr. Felton, and the potency of the dry standard may thus be expressed in terms of the unit originally proposed by Dr. Felton. An official unit for antipneumococcus serum, type I., has not yet been adopted, but it is suggested that, pending the definition of a unit by international agreement, the unit proposed by Dr. Felton shall be provisionally accepted as the basis of measurement for all antipneumococcus sera, type I., intended for clinical use in this country.

The first section of this report deals with the actual preparation of the dry standard and with various tests carried out to ascertain its potency and suitability for use and distribution. This part of the work was carried out at the National Institute for Medical Research.

The second section contains the records of comparative tests of the dry standard and the liquid antiserum, F. 146, supplied by Dr. Felton; these were carried out at the Lister Institute, Elstree, the National Institute for Medical Research, Hampstead, and the Wellcome Physiological Research Laboratories, Beckenham. For reasons of economy and convenience, it is desirable to issue the standard in the form of a glycerol solution. It was therefore necessary to ascertain whether the antibody is stable in this form, and whether the presence of glycerol interferes in any way with the performance of the tests. Accordingly, a glycerol solution of the standard was prepared at Hampstead and compared in the three participating laboratories with the dry standard after reconstruction in salt solution. The tests were carried out independently, each laboratory applying its own methods of comparative estimation.

The dry standard which has been prepared is available for workers who are interested in the titration of antipneumococcus serum, type I., in this and other countries. Application for the standard should be made to the Department of Biological Standards, the National Institute for Medical Research, London, N.W. 3, where arrangements have been made for its distribution at regular half-yearly intervals.

I. Preparation and Tests of the Standard Serum

1. *Preparation.*—The dry standard has been prepared from a natural antipneumococcus serum, type I., of high potency. Following the usual technique adopted in the Institute for Medical Research for the preparation of antisera in the dry stable condition, 5 c.cm. quantities of the natural serum were delivered, by means of a precision distribution apparatus, into a series of dry sterilised ampoules. By exposure to the action of phosphorus pentoxide in vacuo the contents of the ampoules were reduced to absolute dryness, as shown by the attainment of constant weight by a number of selected ampoules. The ampoules were then filled with pure, dry nitrogen gas and sealed. The whole of the ampoules containing the dry standard, amounting to about 300 in all, are stored continuously in the dark at −2° C. to −4° C.

2. *The total solids in the sealed ampoules of the standard.*—Each ampoule contains the total solids from 5 c.cm. of the original antiserum. The weights of the total solids in seven ampoules selected at random were found to be as follows: 0·4423, 0·4417, 0·4455, 0·4400, 0·4461, 0·4438, 0·4407 g. Mean weight, 0·4429 g.

3. In *reconstructing the dry standard* the following procedure has been adopted in the three participating laboratories, and it is suggested that the same plan be followed by other laboratories using the standard:—

On the day preceding that on which the standard is to be used, an ampoule is opened near the sealed end

and 5 c.cm. of sterile distilled water added. The ampoule is placed in the incubator or a water bath at 37° C. for about an hour, and the neck of the ampoule is then rotated between the palms of the hands. If the solid has not dissolved completely, the ampoule is allowed to stand at room temperature and is gently rotated at intervals until solution is complete. The ampoule is then stored in the cold room until required.

The product is not quite completely soluble. On standing overnight it will be found that the supernatant fluid is clear and bright yellow in colour, but there is a very small deposit of a fine white solid at the bottom of the ampoule. The reconstructed serum may now be shaken to secure thorough mixing; the small amount of insoluble material may be disregarded and the slightly opalescent fluid used in the tests.

4. *Sterility.*—Tests carried out on ampoules selected at random during the operation of filling out and on samples of the reconstructed standard have shown that the product is sterile. Provided that the usual aseptic precautions are taken in removing portions of the solution and that the main bulk is preserved at low temperatures, each ampoule will afford sufficient material for a number of tests.

5. *Preparation of a glycerol solution of the standard.* In order to economise the standard preparation and at the same time produce it for use in a convenient yet stable form, a solution of the standard in 66 per cent. glycerol saline has been prepared. Glycerol saline (25 c.cm.) was used for dissolving the contents of one ampoule, so that the strength of this glycerol solution should be one-fifth that of the solution obtained by reconstruction as described in (3) above. The results of the tests of the relative potencies of these two solutions of the standard preparation are recorded in the second section of this report.

6. *Comparative tests of the dry standard and the serum from which it was prepared.*—The contents of one ampoule of the dry standard were dissolved as described under (3) above. The potency of the solution so obtained was compared with that of the original antiserum by the mouse protection test and the precipitation test (Smith, 1932).

(*a*) *The Mouse Protection Test.*—Five different doses of the reconstructed serum and five similar doses of the original serum were tested against a constant dose of virulent pneumococci (0·01 c.cm. of an 18-hour blood broth culture), 40 mice being used for each serum dose. The mice were inoculated intraperitoneally, in each case the inoculum being 1 c.cm. of a mixture of pneumococci and a particular dose of serum. The mixtures were made exactly five minutes before the inoculations of the corresponding group of 40 mice were begun. The experiment was terminated on the seventh day, up to which time the deaths were recorded at 24-hour intervals.

The results of the mouse protection test showed no significant difference between the protective powers of the dried and original sera, for the slight differences of percentage mortality in corresponding groups of mice lie well within the error of the test, as calculated by Trevan (1930). It may therefore be safely assumed that the manipulations involved in the preparation of the standard did not appreciably diminish the protective power.

(*b*) *The Precipitation Test.*—One of us (Smith, 1932) has elaborated an in-vitro test for estimating the potency of antipneumococcus sera based upon the precipitation reaction which occurs when such sera are mixed with the specific soluble substance of Heidelberger and Avery (1923). The strength of a serum is measured by the ratio of soluble specific substance to serum found necessary to produce "optimal precipitation," Dean and Webb (1926). It was shown that the precipitation ratios thus obtained were an excellent measure of the mouse protection values in the case of unconcentrated antisera. Unfortunately, for the purposes of titration, this was not found to hold true for certain concentrated antibody preparations. Nevertheless, it was felt that a serum chosen at the present time to serve as a provisional standard ought to possess good and constant precipitating properties, so that it might be used, if desired, in this or some other similar in-vitro method of assay.

Tests made with the original serum before preparation of the dried standard was begun showed that its precipitation behaviour was quite typical. It was shown furthermore that its value, in terms of other sera, was the same whether measured by the precipitation test or by the mouse protection test. These results indicated that the serum was entirely suitable for the purpose in view.

When the process of desiccation had been completed several phials were selected at random and the dried serum of each was reconstructed to the original volume. The samples were then tested by the precipitation test in parallel with a sample of the original serum which had been kept in cold storage. The results obtained showed that desiccation had slightly reduced the reaction velocity of the serum but had not altered its precipitation ratio.

II. Comparative Tests of the Dry Standard and the Liquid Antipneumococcus Serum F. 146

For the purpose of the comparative tests, described below, the following preparations of antipneumococcus serum were supplied :—

(1) Antipneumococcus serum, F. 146 (Felton). Each of the participating laboratories supplied two ampoules (40 c.cm. from each laboratory) of antiserum F. 146. The contents of the six ampoules were mixed and samples of the pooled serum sent to each laboratory.

(2) The dry standard. In each laboratory the contents of one ampoule were dissolved in 5 c.cm. of sterile salt solution in the manner described above.*

(3) Samples of the glycerol solution, prepared as described above, were sent to each laboratory.

The relative potency of the dry standard and the antiserum F. 146 was of course unknown. The participating laboratories were informed that the glycerol solution should have a potency equal to one-fifth of the potency of the solution obtained by reconstruction of the dry standard in 5 c.cm. of salt solution; the purpose of the comparative tests of the glycerol solution was to determine whether this ratio was confirmed by experiment.

A. TESTS AT THE LISTER INSTITUTE, ELSTREE

(*a*) *Comparative tests of the reconstructed standard serum and the pooled serum F. 146.*—The dry standard serum was reconstructed in saline solution in accordance with the procedure that has already been described. Dilutions of the reconstructed standard serum and the pooled serum F. 146 were so made that varying doses were contained in a constant volume of 0·5 c.cm.; these were injected intravenously into groups of ten, or multiples of ten, mice. One hour later a dose of 0·001 c.cm. of an 18-hour horse serum broth culture of a virulent strain of pneumococcus, contained in a volume of 0·5 c.cm., was injected intraperitoneally into the test animals. Experience has shown that when this method is used, most of the deaths occur during the second and third days of the test; for this reason the observations were limited to a period of four days.

A summary of the combined results of three separate tests is given in Table I. The data indicate

* Subsequent experience has shown that sterile distilled water is a better solvent.

that approximately equal mortality-rates were obtained when the reconstructed standard serum and the pooled serum F. 146 were diluted in the ratio 1 : 5. Thus, 0·001 c.cm. of the reconstructed standard serum gave a mortality-rate of 27·5 per cent., and 0·005 c.cm. of serum F. 146 gave a mortality-rate of 30 per cent. Similarly 50 per cent. of the mice died when they received 0·0005 c.cm. of the reconstructed standard serum or 0·0025 c.cm. of serum F. 146.

The serum doses in these tests were given to the mice one hour before the test dose of culture, and thus the serum functioned as a prophylactic agent. Experimental work on the curative action of antipneumococcus serum (type I.) has indicated that a method of titration of the specific antibody may be employed by arranging for the intravenous administration of graduated doses of the serum to groups of mice at a suitable interval after a highly lethal dose of the culture has been given to them intraperitoneally (Petrie and Morgan, 1932). When the serum is given to mice under these conditions it is capable of exerting a curative action and of bringing about complete recovery, even when a bacteræmia is present. The relative efficiency of the reconstructed standard serum and serum F. 146 as a curative agent has been tested by this method.

The infecting dose that was chosen was 0·000,000,05 c.cm. and it gave a mortality-rate in control mice of 82 per cent.; the interval between the dose of culture and the intravenous dose of serum was 12 hours. The summed results of the tests are included in Table I., and they show that an equivalent curative effect was obtained when the doses were so arranged that in each of a number of tests the amount of serum F. 146 which was administered to the mice was exactly five times that of the standard serum; the amount of serum that was given in the individual tests ranged from 0·005 to 0·00125 c.cm. of the reconstructed serum, and from 0·025 to 0·00625 c.cm. of serum F. 146. The difference between the mortality-rates in the two groups of mice—namely, 6·6 per cent.—is not statistically significant. The mean mortality-rate in the two groups is about 40 per cent., so that in this experiment the specific serum has halved the number of deaths, as compared with the control group.

The results of the prophylactic and the curative tests confirm each other, and thus the conclusion may be drawn that the potency ratio of the reconstructed standard serum and serum F. 146 is 5 : 1.

(*b*) *Comparison of the potency of the dry standard serum after reconstruction in saline and of a fivefold dilution of this in glycerol saline solution.*—The comparison was made by employing the prophylactic method which has been described above. Doses of the serum solutions with a constant ratio of 1 : 5 were injected into equal groups of mice; thus the doses varied from 0·0008 to 0·00067 c.cm. of the reconstructed serum, and from 0·004 to 0·003 c.cm. of the glycerol solution. The results are given in Table I., and they show that, in correspondence with the dilution ratio, the reconstructed standard serum possesses five times the protective value of the glycerol solution.

B. TESTS AT THE NATIONAL INSTITUTE FOR MEDICAL RESEARCH

(*a*) *Comparative tests of the dry standard serum and serum F. 146.*—Two separate comparative tests of the two sera under consideration were made. The technique followed was that used in the mouse tests recorded in the first section of this report. In each test five different doses of each serum were tested against a constant dose of fully virulent pneumococci (0·01 c.cm. of an 18-hour blood broth culture). Forty mice were used for each serum dose, so that 400 mice were used in each test. The doses of the dry standard serum employed were such as from previous experience could be expected to yield a satisfactory mortality curve, ranging from a high to a low percentage mortality.

The doses of serum F. 146 used in the first test were seven times the corresponding doses of the standard serum, but for the second test they were adjusted to five times the doses of the standard serum, because an examination of the two sera by the precipitation test (Smith, 1932) showed that the precipitation ratio was dry standard serum : F. 146 = 5 : 1. The results are given in Table II.

TABLE I

SUMMARISING THE RESULTS OF PROPHYLACTIC AND CURATIVE TESTS IN MICE TO DETERMINE THE POTENCY RATIO OF (1) THE RECONSTRUCTED STANDARD SERUM AND THE POOLED SERUM F. 146, AND (2) THE RECONSTRUCTED STANDARD SERUM AND A FIVEFOLD DILUTION OF IT IN GLYCEROL SALINE

Type of experiment.	Dry standard serum. Dose in c.cm.	Serum F. 146. Dose in c.cm.	Glycerinated standard serum. Dose in c.cm.	Group mortality.			Percentage mortality.		
				Dry standard.	F. 146.	Glycerol standard.	Dry standard.	F. 146.	Glycerol standard.
Prophylactic.	0·0005	0·0025	—	15/30	15/30	—	50	50	—
,,	0·001	0·005	—	11/40	9/30	—	27·5	30	—
Curative.	0·005–0·00125	0·025–0·00625	—	52/120	44/120	—	43·3	36·7	—
Prophylactic.	0·0008–0·00067	—	0·004–0·003	71/100	—	74/100	71	—	74

TABLE II

FIRST TEST

Culture dose in c.cm.	Dry standard dose in c.cm.	F. 146 dose in c.cm.	Group mortality.		Per cent. mortality.	
			Dry standard	F. 146	Dry standard	F. 146
0·01	0·0002232	0·0015625	36	32	90	80
,,	0·0004464	0·003125	30	21	75	52·5
,,	0·0008928	0·00625	22	12	55	30
,,	0·00178	0·0125	13	6	32·5	15
,,	0·00357	0·025	9	3	22·5	7·5
SECOND TEST						
0·01	0·00025	0·00125	39	38	97·5	95
,,	0·0005	0·0025	33	33	82·5	82·5
,,	0·001	0·005	22	20	55	50
,,	0·002	0·01	15	15	37·5	37·5
,,	0·004	0·02	9	9	22·5	22·5

From the results of the first test it would appear that the British standard serum is about 3·5 times

more potent than serum F. 146. In the second test practically identical mortality-rates were obtained after adjusting the doses of serum F. 146 on the basis of the precipitation ratio; that is, by making them five times greater than the corresponding doses of the dry standard serum. The two tests taken in conjunction would therefore suggest that the dry standard equals 4·25 times serum F. 146.

(*b*) *Comparison of the potencies of the dry standard reconstructed in salt solution and a glycerol solution of the standard.*—The potency of the two solutions was compared by a mouse protection test similar in all respects to that described above. The volumes of the glycerol solution of the standard serum injected were five times as great as the corresponding doses of the salt solution of the standard. The results of the test showed that the glycerol solution of antibody had exactly one-fifth the protective power of the standard serum, so that the presence of 66 per cent. glycerol could have had no deleterious action upon the protective antibodies measurable by the mouse test.

The results of precipitation tests were also in complete agreement with the known volumetric ratio of the two preparations, the antigen-antibody ratio of the reconstructed standard serum being just five times greater than that of the glycerol solution. Thus the glycerol solution may be used as a standard in those methods of assay which are based upon the flocculation of the soluble specific substance of the pneumococcus, type I.

C. TESTS AT THE WELLCOME PHYSIOLOGICAL RESEARCH LABORATORIES

(*a*) *Comparison of the dry standard serum and serum F. 146.*—The relationship between the reconstructed serum and the pooled serum F. 146 was estimated by a technique similar to that described in Section I. (par. 6) (also see Parish, 1930). Tests were made in the first instance with small groups of four or five mice, as in routine titrations in these laboratories. Groups were injected with five doses of the reconstructed standard serum and four doses of F. 146, and the potency values of the dried serum calculated in terms of F. 146 by working out the mean protective dose by Kärber's (1931) method of calculation. (The actual calculations were carried out with the logarithms of the doses.) The mean protective dose is the dose which will protect the "average" mouse of the group tested, and is approximately the dose protecting 50 per cent. of animals. These preliminary tests indicated that the average value of the dry standard is about four times F. 146.

Two experiments on a larger scale were then set up, in each of which 480 mice were used. In each experiment the contents of one phial of the dry standard were dissolved, as described above, and a comparison made with the pooled F. 146. The doses of F. 146 were four times those of the dry standard. Each dose was administered to 40 mice, with a dose of culture of 0·01 c.cm. (Table III.). Two sets of mortality results are given in the Table, representing the results up to 48 hours and up to six days. By the same arithmetical procedure as before, the mean protecting doses were calculated.

The ratios of the potencies are inversely proportional to the ratio of the mean protecting doses. From the six-day results the ratio of the dry standard to F. 146 varies from 2·6 to 4·29 with a mean, weighted for the number of mice used, of 3·2. For the two-day results the variation is less—from 4 to 5—with a weighted mean of 4·49. The two-day results correspond more closely with the precipitation ratio. All the two-day figures give higher values except one.

(*b*) *Comparison of the potencies of the dry standard reconstructed in salt solution and a glycerol solution of the standard.*—The comparison was made by a mouse protection test, in which 300 mice were used. The doses of the glycerol solution of the standard were four times those of the solution of the standard in saline. Twenty-five mice were injected with each dose of serum, the culture dose being 0·01 c.cm. The results of the test showed that if deaths occurring within six days are adopted as the basis of the calculation, the potency ratio of the reconstructed serum to the glycerol solution is identical with the dilution ratio (viz., 5 : 1) but if two-day results are taken the potency ratio is 4·2 : 1.

TABLE III

Culture dose 0·01 c.cm. 40 mice in each group

No. of titration.	Dry standard; dose in c.cm.	F. 146; dose in c.cm.	Group mortality.			
			Six days.		Two days.	
			Dry standard.	F. 146.	Dry standard.	F. 146.
1	0·0003125	0·00125	40	40	30	39
	0·000625	0·0025	38	31	16	27
	0·00125	0·005	18	10	4	7
	0·0025	0·01	14	9	3	3
	0·005	0·02	8	2	1	0
	0·01	0·04	2	3	0	1
2	0·0003125	0·00125	40	40	39	34
	0·000625	0·0025	37	38	37	24
	0·00125	0·005	23	19	5	10
	0·0025	0·01	12	22	8	4
	0·005	0·02	7	10	1	2
	0·01	0·04	12	9	1	3

Summary and Conclusions

1. A dry, stable standard preparation of antipneumococcus serum, type I., has been prepared and assayed in terms of a liquid antipneumococcus serum, type I. (F. 146), supplied by Dr. Lloyd D. Felton, of Harvard.

2. Pending the definition of a unit by international agreement, it is suggested that the unit originally proposed by Dr. Felton should be provisionally adopted as the basis of measurement for antipneumococcus serum, type I. One such unit is contained in 0·0886 mg. of the dry stable standard preparation now available.

3. The results of the comparative tests on the same reagents, carried out independently by three different laboratories using different methods of titration, show a fair measure of agreement.

4. All samples of antipneumococcus serum, type I., of unknown potency should be tested in relation to a standard antiserum. The use in all such tests of a common standard would render the results obtained in different laboratories and hospitals throughout the world more readily and directly comparable. The standard preparation is available to all workers who desire to make use of it, by application to the Department of Biological Standards, the National Institute for Medical Research, N.W.3.

The experimental work described in Section I. was carried out by P. Hartley and Wilson Smith; that described in Section II. A by G. F. Petrie in collaboration with W. T. J. Morgan; that described in Section II. B by

Wilson Smith; and that described in Section II. c by H. J. Parish in collaboration with J. W. Trevan.

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THE CAMBRIDGE MEDICAL CURRICULUM

IN 1931 a memorandum on the curriculum of medical students at Cambridge was submitted to the Vice-Chancellor of the University with influential endorsement which was designed to show that a scrutiny of the educational course of the resident students required radical changes. The memorandum was published in THE LANCET of July 30th, 1932, a considerable interval of time having elapsed between its delivery and the report of the University Syndicate upon it. The memorandum gave reasons for the institution of a Medical Sciences Tripos as a practical method of adjusting the double claims of medicine upon medical students as a professional calling and as a university faculty. The Syndicate at that time looked favourably upon the arguments employed in the memorandum, but there were differences of opinion, not only in university circles, but among all authorities on education as to the wisdom of setting up the new tripos, and the Syndicate suggested that, if instituted, it should carry on only for a probationary period of five years.

Now an amended report of the Syndicate on the medical curriculum has been published, showing that the Syndicate have reconsidered their earlier views. During the past year the opinions of a number of resident and non-resident graduates have been ascertained, and a majority both of the resident and non-resident graduates are opposed to the introduction of a Medical Sciences Tripos, holding that the necessary reforms in medical education in the University can be effected inside the existing Natural Sciences Tripos. The existing plan of the curriculum is set out in detail in the current Students' Number of THE LANCET,[1] and, as far as the medical students carrying on their studies at the University are concerned, it is only the examinations for the First and for the Second M.B. that are under discussion in relation to the Natural Sciences Tripos; but here a duplication of courses and examinations, both vexatious and uneconomical, exists.

Agreement has now been reached between the Syndicate and the Natural Sciences Tripos Committee whereby the substance of the proposals for a Medical Sciences Tripos can be incorporated in the Natural Sciences Tripos; and it is believed that the changes will meet the requirements of medical students in Cambridge. The report runs:—

Anatomy.—The present system of examinations divides the study of anatomy artificially into the study of the topographical detail which is demanded of the student in the Second M.B. Examination, Part II., and the study of the scientific anatomy—i.e., morphology and embryology—which is required of him in the Natural Sciences Tripos, Part I. Students tend to concentrate on topographical anatomy for the Second M.B. Examination, Part II., during the first two years, and on embryology and morphology during the last year before the Tripos. The Syndicate hold the view that topographical anatomy, embryology, and morphology should be taught together as one subject. On the other hand, they are of opinion that the student should not be expected to memorise too much topographical detail for a Tripos Examination. The Syndicate therefore suggest that anatomy in the Natural Sciences Tripos should consist of equal proportions of scientific anatomy (morphology and embryology) and topographical anatomy. The knowledge of topographical anatomy demanded should be on broader lines and of less detailed character than that ordinarily required in the Second M.B. Examination, and should deal mainly with the general architecture of the body together with a more detailed knowledge of certain important areas such as the nervous system. A student who obtains honours in the Tripos should not be allowed to proceed to the Third M.B. Examination unless he has satisfied the examiners in anatomy, dissected the whole body, and passed a series of practical tests to ensure that dissection has been adequately and thoroughly carried out.

Physiology.—At the present time the chemical part of physiology is taught in the Department of Biochemistry. In their previous report the Syndicate gave reasons why this arrangement is not altogether satisfactory, and they again recommend that provision be made for the student to learn the chemical part of physiology in the Department of Physiology, and to study in the Department of Biochemistry some of the biochemistry which is less closely related to particular branches of physiology but useful to the education of a medical student. Proposals for the teaching of pharmacology are given below, and the Syndicate suggest that there should be optional questions in pharmacology set in the physiology papers in the Natural Sciences Tripos for students who have already taken the course in pharmacology with a view to proceeding to the Final Examination for the M.B. Degree. A student who obtains honours in the Tripos should not be allowed to proceed to the Final Examination for the M.B. Degree unless he has satisfied the examiners in physiology.

Pharmacology.—Pharmacology is at present taught to students in two alternative courses in the Lent term and in the Long Vacation. The student is examined in pharmacology in the Second M.B. Examination, Part III., and in the Third M.B. Examination, Part II. The Syndicate do not propose to include pharmacology as a subject in Part I. of the Natural Sciences Tripos. They suggest, however, that identical courses in pharmacology should be held in the Lent term and in the Long Vacation, and that a student should not be allowed to proceed to the Final Examination for the M.B. Degree until he has attended this course (or a course in pharmacology elsewhere approved by the Faculty Board of Medicine) and passed a viva voce examination in pharmacology in Cambridge. As suggested above, however, optional questions in pharmacology are to be set in the physiology papers in the Natural Sciences Tripos for students who have taken the course in pharmacology before the Tripos. This will ensure that all medical students study some pharmacology at this stage, and pharmacology will have a place in Part I. of the Natural Sciences Tripos. Students who take Part I. of the Tripos in three years would probably take the course in pharmacology in the Lent term or Long Vacation before the Tripos, but students who take Part I. in two years should be advised to leave the course in pharmacology until the Long Vacation after they have taken Part II. of the Tripos in order not to interfere with their Part II. work. The Syndicate also suggest that there should be opportunity for the student to study pharmacology in conjunction with physiology for the Natural Sciences Tripos, Part II.

The subjects for the Second M.B. examination include also *general pathology*, and the Syndicate consider it desirable to introduce this subject, including bacteriology, as a half-subject in Part I. of the Natural Sciences Tripos, the elements of general pathology to be taught during the last year of work in anatomy and physiology. But as an examination in pathology forms part of the final M.B. examination, it is not suggested that candidates should be required

[1] THE LANCET, August 27th, 1932, p. 430.

to take pathology in the Tripos in order to qualify for admission to this examination. Students should not be allowed to take the course in pathology in the first year.

With regard to *chemistry* and *biochemistry* the Syndicate reports :—

Biochemistry.—Biochemistry is at present a subject in Part II., but is not yet a subject in Part I., of the Natural Sciences Tripos. Unless a student takes Part II. of the Tripos, the only training in biochemistry which he can obtain at the present time is the biochemistry which is taught in conjunction with physiology and as part of that subject. The Syndicate are of opinion that in view of the growing importance of biochemistry in scientific research and in medical practice the present opportunities for the medical students to learn general biochemistry are inadequate. In their previous report, therefore, the Syndicate proposed that biochemistry should be a half subject in the Medical Sciences Tripos, Part I. With the concurrence of the Natural Sciences Tripos Committee they now propose that biochemistry should be a half subject in the Natural Sciences Tripos, Part I., but are of opinion that in general medical students would be well advised not to take biochemistry until at least their second year.

Chemistry.—At the present time rather less than half the medical students take chemistry as a subject in the Natural Sciences Tripos, Part I. The reason appears to be that the subject is difficult and its scope is too great for the average student to study pure chemistry satisfactorily in conjunction with other such time-absorbing subjects as anatomy and physiology. Moreover, zoology fits in more easily with anatomy and physiology, and zoology is therefore more often taken in the Natural Sciences Tripos, Part I., than chemistry. But it is important that those medical students who wish to study chemistry should have an opportunity to offer this subject in the Natural Sciences Tripos, and the Syndicate in their previous report advocated a half subject in chemistry in Part I. of the Medical Sciences Tripos. The Committee for the Natural Sciences Tripos have now agreed, at the request of the Faculty Board of Physics and Chemistry, to propose to the University the introduction of two half subjects in chemistry : inorganic and physical chemistry, and organic chemistry. Each half subject would include general chemistry, and the two half subjects together would form the whole subject chemistry.

The opinion is recorded that students, having the time and the bent, should be encouraged to take zoology as a part subject in the Natural Sciences Tripos, while there is a further suggestion that they should be allowed to be examined in psychology in substitution for certain tests in physiology. It is considered undesirable that they should attempt to learn the elements of clinical medicine while working for the Natural Sciences Tripos. In deciding the hours allocated to each subject the Syndicate have been guided by a desire to make it possible for a good student who has passed the whole of the First M.B. examination before residence to take the Natural Sciences Tripos in three subjects at the end of his second year ; and a table is appended to show how the student who takes *anatomy* and *physiology* and attempts the Tripos in two years would spend his time.

The Syndicate are of opinion that the Cambridge M.B. Degree should normally imply a high standard in the preclinical training in science which Cambridge is peculiarly qualified to give as well as a high standard in the final examination in clinical subjects. The report runs :—

An ordinary student should be required to have obtained honours in the Natural Sciences Tripos, Part I. or Part II., or to have attained later to an honours standard in the Natural Sciences Tripos, Part I., Examination, before admission to the Final Examination for the M.B. Degree. The Syndicate therefore propose that Parts II. and III. of the Second M.B. Examination be abolished, that Part I. of the Second M.B. Examination (Organic Chemistry) be transferred to and become Part IV. of the First M.B. Examination, and that qualifying examinations in anatomy and physiology be provided for students who have obtained honours in the Tripos but who have not offered anatomy and physiology among their subjects and for those who have obtained honours but failed to reach a qualifying standard in anatomy or physiology. The student who fails to obtain honours in the Tripos should be required to take the whole examination again, even if he has reached the qualifying standard in anatomy or physiology or in both. The scope of the Qualifying Examination in Physiology should be the same as the examination in physiology in the Natural Sciences Tripos, Part I. The Syndicate are of opinion, however, that the Qualifying Examination in Anatomy might reasonably contain a lesser proportion of scientific anatomy than the examination in anatomy in the Tripos, and suggest that this examination be modelled on the lines of the examination in anatomy as a two-unit subject in the proposed Medical Sciences Tripos of their first report.

In view of the fact that there will be no Second M.B. examination, the Syndicate proposed that in future the Third M.B. examination should be called the Final Examination for the M.B. Degree.

Of the numerous detailed recommendations of the Syndicate the following are those which show how carefully the intention has been observed to fuse the professional M.B. course with the honours course of the Natural Sciences Tripos. It will be seen that the circumstances of students who are unable to proceed in accordance with the usual pattern have been taken into consideration :—

That biochemistry and pathology be introduced as half-subjects in the Natural Sciences Tripos, Part I.

That two half subjects in chemistry be introduced into the Natural Sciences Tripos, Part I., one inorganic and physical chemistry and the other chemistry, each including general chemistry ; and that the two half subjects together form the whole subject chemistry.

That the subject zoology in Part I. of the Natural Sciences Tripos be divided into two sections "A" and "B," each involving the same amount of work ; that Zoology "A" be a half subject suitable for the medical student, and that Zoology "A" be taken with Zoology "B" to make the whole subject.

That the scope of anatomy as a subject in the Natural Sciences Tripos, Part I., be modified so that it consists of equal proportions of topographical anatomy and scientific anatomy—i.e., embryology and morphology.

That the scope of physiology as a subject in the Natural Sciences Tripos be left unchanged, but that optional questions in pharmacology for students of medicine be set in the written papers.

That a candidate for the Natural Sciences Tripos, Part I., instead of being required to take three subjects, excluding mathematics, should be required to take at least three whole subjects or at least two whole subjects and two half subjects, mathematics constituting a half subject.

That the Natural Sciences Tripos, Part II., be modified by the introduction of pharmacology and psychology ; that the examination in pharmacology consist of one paper, and when the finances of the department permit, two papers in pharmacology with a corresponding practical examination and a viva voce examination, and three or two of the papers in the concurrent examination in physiology with the corresponding practical examination in physiology ; that the examination in psychology consist of two papers in psychology, a viva voce examination, and a practical examination, and two papers in the concurrent examination in physiology with the corresponding practical examination ; and that in the class-lists students be described as having taken physiology, or physiology with pharmacology when one paper in pharmacology has been taken, or physiology and pharmacology when two papers in pharmacology have been taken, or physiology and psychology.

That a student who has passed, or been exempted from, the First M.B. Examination be allowed to proceed to the Final Examination for the M.B. Degree if he has (*a*) obtained honours in the Natural Sciences Tripos, Part I., or being over the standing for honours has attained to an honours standard, and taken anatomy and physiology as subjects in the Tripos, (*b*) furnished evidence of having dissected the whole body and of having passed a series of practical tests to ensure that his dissection has been adequately and thoroughly carried out, (*c*) satisfied the examiners in anatomy in the Tripos, (*d*) satisfied the examiners in physiology in the Tripos, (*e*) attended the course in pharmacology in Cambridge, or some other course approved by the Faculty Board of Medicine, and passed the viva voce examination in pharmacology in Cambridge.

That the Qualifying Examination in Physiology be of the same scope as the examination in physiology in the Natural Sciences Tripos, Part I. : and that the Qualifying Examination in Anatomy contain a lesser proportion of scientific anatomy and a greater proportion of topographical anatomy than the examination in anatomy in the Natural Sciences Tripos, Part I.

That a student who has passed, or been exempted from, the First M.B. Examination and has obtained honours in the Natural Sciences Tripos, Part I. or II., or being over the standing to obtain honours has attained to an honours' standard, and has failed to satisfy the examiners in anatomy or physiology or both, or has not offered anatomy or physiology, or either anatomy or physiology among his subjects, be entitled to proceed to the Final Examination for the M.B. on passing the Qualifying Examination in anatomy or physiology, or if he has previously satisfied the examiners in anatomy in the Tripos the qualifying examination in physiology, provided that he has furnished evidence of having dissected the whole body and of having passed a series of tests to ensure that his dissection has been adequately and thoroughly carried out, and that he has attended the course in pharmacology in Cambridge, or some other course approved by the Faculty Board of Medicine, and passed the viva voce examination in pharmacology in Cambridge.

Further recommendations are that the student obtaining honours in any part of the Tripos may proceed to the Final M.B. examination when he has passed or been exempted from the First M.B. and the qualifying examinations in *anatomy* and *physiology* and completed a course in *pharmacology*. Further, the student who has passed or been exempted from the whole of the First M.B. examination and the qualifying examination in *anatomy* and *physiology* may proceed to the B.A. Degree on passing (*a*) the special examination in psychology ; (*b*) the relevant part of the general examination ; or (*c*) the examination in pathology ; or (*d*) that in *biochemistry* in the Natural Sciences Tripos, Part I.

The report closes with the new regulations with regard to the thesis for the M.D. Degree.

BRITISH SOCIAL HYGIENE COUNCIL

THE biennial conference of this council has been held in London this week and papers on various aspects of social health have been presented and discussed.

TREATMENT OF GONORRHŒA

Papers on the treatment of gonorrhœa were read by Dr. Gladys M. Sandes, Dr. A. J. Hawe, Dr. M. T. Morgan, and Captain W. Happer together with Dr. Rajam.

Dr. SANDES dealt especially with the prevention of complications in the female, and emphasised the great importance of accurate diagnosis, which was, she said, nearly always possible to the trained observer. When acute gonorrhœa was present it was far better to do too little than too much, and to avoid all active local treatment until the subacute stage. Complications could not always be avoided. A number of women developed pelvic parametritis or salpingitis directly after the monthly period, and when possible the patient should be kept in bed for the first few days of a period occurring during the acute or subacute stage. A suburethral abscess might be prevented by urethral massage and careful search for infected Skene's ducts. The only drug that had impressed Dr. Sandes for the acute stage was manganese butyrate ; psychological treatment was also of the greatest importance.

Dr. A. J. HAWE considered the treatment of gonorrhœa and its complications with special reference to work on the Gold Coast, where patients usually presented themselves with complications well established. European treatment was unpopular, partly because the male African regarded the disease as a natural and rather unimportant event in his life and partly because of the brilliant results of treating yaws, which led the African to demand miracles which could not be achieved in the treatment of gonorrhœa. Moreover, the African would always try native treatment first, and damage was thereby done to many patients. Only the simplest treatment could be safely applied in the dispensaries where most of the men had to be treated, but orthodox methods were used in the hospitals. It was extremely difficult to persuade patients to stay long enough for cure. A coexisting bilharzia complicated diagnosis and treatment. None of the complications were peculiar to Africa ; arthralgia was very common and might possibly be due to a re-awakening of yaws. Novarsenobillon had a remarkable alleviating effect. A routine Wassermann test would be useful. Conjunctivitis and vaginitis were also common. Dr. Hawe's conclusion was that the modern treatment of gonorrhœa was unsuitable for the uneducated African native.

Captain HAPPER and Dr. RAJAM described conditions in South India, where the disease, they said, was mild among the native people, but in Europeans was even more intractable than at home. Doctors, however, suffered from the usual trouble—that the patients would regard disappearance of symptoms as equivalent to cure, and women especially delayed in seeking help. Treatment was on Western lines and complications were rare in the male, but it seemed to be only a question of time before a woman developed pelvic complications. Syphilis was also widespread but was a severe disease, the secondary manifestations being much graver than in Britain. Nervous complications were seen but were not common. The great problem in the treatment of venereal disease was the failure of the patient to give intelligent coöperation.

Dr. MORGAN dealt with the 1924 Brussels agreement for the free treatment of merchant seamen. Each seaman suffering from venereal disease received, he said, a private and personal international card which he could carry from port to port, obtaining treatment at each and a supply of the necessary drugs for the voyage. The Stationery Office now published the list (originally drawn up by the National Social Hygiene Council) of the names and addresses of port clinics with their hours of consultation, but in future this would be published by the International Office of Public Health. As a result of the agreement, great progress had been made.

ADMINISTRATIVE ATTITUDE TO SOCIAL PROBLEMS

Dr. T. DRUMMOND SHIELS discussed the extent to which it was desirable to interfere with established

social custom among primitive peoples. Recent anthropological investigation had resulted in a tendency to deprecate any modernisation of tribal life, but no people could be shut up with their past and present in a rapidly changing and developing world. Moreover, detribalisation was increasing steadily. The modern attitude was that customs for which there was obvious economic and social justification should be at any rate tolerated, and that if change was desirable it should be achieved by education and propaganda only. The French method, on the other hand, was to use every endeavour to impress the language and culture of the governing country on the native community. Probably both methods had their value, and the broad principle must be that the native peoples should have the opportunity of rising to their full stature, by combining the best in their own traditions with anything of value that the governing people had to add.

The Rev. A. G. FRASER described the effect on established social customs in the Gold Coast of modern knowledge and economic conditions. He mentioned an interesting discussion among African students as to which customs they should renounce and which they should keep, showing clearly that the African would choose for himself. The main business of the European was to impart an understanding of Western civilisation. If evolution and not revolution were desired, the children of another race should never be educated without seeing to it that the parents and leaders of that race had a weighty, if not a dominant share in that education.

Mr. HERBERT ANDERSON read a paper on changes in the outlook on Prostitution in India. He said that the women's movement in India held the key of progress and had grown with an unparalleled rapidity and vigour. A recent Act in Bengal penalised those who profited by the immoral earnings of others, and brothels were illegal in Bombay, Burma, and Ceylon. Enlightened civic opinion in India demanded to-day a new standard of public decency.

BIOLOGICAL TEACHING

Dr. W. K. SPENCER discussed recent progress in biological teaching, and urged the necessity for a new technique, now that biology was being taught to children and adolescents as well as to adults. Other speakers described the teaching of biology in Hong-Kong and in other colonies and dependencies, and the present difficulties and problems presented by the subject. The League of Nations' Inquiry in the Far East was the subject of a paper by Mr. S. Cohen; seamen's welfare in the ports of India was discussed by Mr. W. R. S. Sharpe and Mrs. McD. Henry spoke on the need for antenatal work among the women of the outlying districts of West Africa.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

THE MEANS TEST AND MALNUTRITION

Dr. John Guy, medical officer of health for Edinburgh, has made an inquiry into "the effects on health of prolonged subsistence on public assistance scales." An effort was made to get 100 families taken at random, the selection being left to the public assistance officer. In his report Dr. Guy says that the results, from a scientific point of view, were likely to be vitiated because the medical condition of the people prior to the operation of the means test was unknown, and comparison before and after was impossible. But three of the senior and most experienced medical men were detailed to carry out the examinations. These officers were the heads of the child welfare, tuberculosis, and school departments. The results are "in broad outline reasonably reliable."

Of the 100 families invited, only 77 attended. Only one family showed chronic undernourishment which could not be explained on medical grounds. In all the others, the examiners were of opinion that the undernourishment was due to the causes stated. In a case where there were four children suffering from chronic undernourishment, the consumpt unit of the family is 9*s.* 1*d.*, as compared with the average consumpt unit of 9*s.* 2*d.* for the whole of the 77 families examined, and the average amount spent on food was 6*s.* 5*d.* as compared with 4*s.* 7*d.* for the whole area. In addition, all the four children are having free meals at school. The inference is that the undernourishment is due to lack of management rather than to lack of means.

Altogether, 61 mothers presented themselves for examination. In No. 1 area, 6 have been in receipt of assistance for over three years, 2 for four years, 1 for eight years, 1 over ten years, and 2 over eleven years. In No. 2 area, 13 have been in receipt of assistance for over three years, 3 for four years, 4 for five years, 2 for seven years, 2 for eleven years, and 2 for twelve years. In No. 3 area, 4 have been in receipt of assistance for four years. In No. 4 area, 2 have received assistance for four years.

Of the 77 families examined, it is found on the evidence collected that 11 are now receiving more than they did when the husband was employed. The present position is, however, probably even more favourable in the following respects: (1) former irregularity of employment is not always fully allowed for; (2) fall in the cost of living reacts in favour of the assisted; (3) requirement of employees have to be met out of earned income, allowance being made for insurance deductions, tools, and clothing.

Dr. Guy said, so far as children were concerned, that in almost every case where undernourishment was observed, the school medical service had picked out the particular children and put them on the free-meal roll. In tribute to the fine work of the women in making ends meet, Dr. Guy said that out of the consumpt unit (or expenditure on everything) of 9*s.* 2*d.* a week, the wives and mothers had managed to get on an average food nutriment to the value of about 4*s.* 6*d.* per head.

This is a good investigation so far as it goes; but the budgets need to be checked by the many investigations already made in various cities. There are details of incomes of those in regular employment and those in irregular employment. The percentages of income spent on rent in each of the four areas were: 17·8; 18·8; 14·7; 22·27. Average percentages spent on food were: 50·6; 61·9; 50·8; 44·25. One new housing district, as illustrating the effects of re-housing on those who had formerly lived in more congested areas, showed the best group of children during the investigation. This was held to be due to changed environment and other causes.

THE LATE DR. G. R. LIVINGSTON

By the death, on June 29th, of Dr. Livingston, of Dumfries, the medical profession in the south of Scotland loses one of its most influential and gracious personalities. When he went to Dumfries in 1899 as partner to the late Dr. Smith, he already had a distinguished medical record, and had equipped himself for midwifery by a long period of residence in the Rotunda, Dublin. In his practice he carried

out the elaborate technique of that institution, and found keen satisfaction in overcoming the difficulties of maintaining rigid asepsis in the homes. He was senior surgeon at the Dumfries and Galloway Royal Infirmary, one of the best provincial hospitals in Scotland, and acted as president and secretary of the Border Counties branch of the British Medical Association. Before the late war he was medical officer of the 3rd King's Own Scottish Borderers, and in the war he was mobilised as medical officer of the Dumfries and Galloway Territorials. Later he became surgeon specialist in the Eastern theatre of war at the casualty clearing station of the 52nd (Lowland) Division, and he served for some time as surgeon specialist on hospital ships. Ten years ago he was elected to the Dumfries town council, and last year he became a magistrate. As convener of the health committee he gave new life to the local health movement, and his discussion of professional and administrative affairs was always marked by calmness and fairmindedness. He leaves a wife and two children.

PANEL AND CONTRACT PRACTICE

Voluntary Pensions Insurance Scheme

IT transpired at the meeting of the London Insurance Committee on June 22nd that this committee is the only one in England that has protested to the Ministry of Health against the deduction of one shilling per quarter per subscribing member for the cost of collecting premiums to the voluntary pensions insurance scheme. The committee estimated that the extra work involved in connexion with the pensions scheme started by the B.M.A. would be less than that relating to the Voluntary Defence Fund of the panel committee; but that the deduction of one shilling per quarter per practitioner under the former scheme would, if only 1000 practitioners participated, provide an annual sum of about £200; whereas the charge for administration of the Voluntary Defence Fund is only 40 guineas. The committee therefore decided to make no deduction but directed that at the end of 1933 the clerk was to give an estimate to the finance subcommittee of the cost of the additional work involved. The Ministry of Health, in reply, express regret that the committee arrived at this decision without first consulting the Ministry and that . . . work of this nature should only be undertaken by bodies administering public funds on a basis which secures repayment to the bodies concerned of the expenses falling upon them in the performance of functions extraneous to their normal duties. . . . Further consideration was then given to the matter by the finance committee and a letter was sent to the Ministry to the effect that whilst they were quite prepared to assist the scheme, the charge was, in their view, too high; threepence per quarter being ample. . . . They therefore decided to adhere to their previous decision.

A conference was then arranged between the Ministry and representatives of the committee, as a result of which [the committee decided that whilst adhering to the principle set out above they would agree to make deduction for the time being without prejudice as to whether any charge should be made at all when the matter comes up for review later on.

Costly Drugs: Eucortone and Eschatin

It was reported at the same meeting of the insurance committee that one insurance doctor had ordered for one insured person eucortone to the value of £212 16*s.* for the period July, 1932, to March, 1933. Another patient was receiving eschatin between January and March, 1933, at a total cost of £33 2*s.* 3*d.*; it was not stated whether the same doctor prescribed in both cases. Two medical members of the committee deprecated the publicity given to such figures. They thought that there was probably very little evidence that these proprietary articles were any better than others less costly. It was nothing to be proud about in these days when economy was necessary. As the prescriptions were within the regulations nothing could be done, but it was hoped that the proper authorities will eventually investigate and surcharge the doctors concerned.

A representative of the chemists also protested, pointing out that if such a practice were persisted in by all insurance doctors the fund would be bankrupt in a week. Eventually the report was withdrawn to be redrafted, but not before many lay members of the committee had expressed themselves strongly in support of allowing the insured person "millionaire" treatment. They certainly should be allowed to have anything that did them good. Their point was that the doctor attending was the only one to decide what was necessary. One speaker suggested the medical men on the committee were not in order in protesting against such charges. They had never seen the cases nor had they been in consultation about them and therefore had no right to express an opinion. It was stated that the drug had been advised by some consultant and that the doctor was giving it on his advice, but the medical members did not accept this as a satisfactory reason. The opinion was expressed that the treatment was a pure experiment on an insured person at the cost of public funds by a practitioner. The proper way to investigate the action of new drugs was in hospital where a fair number of similar cases could be treated some with and some without the drug to be tested, but that no conclusion of value could be drawn from isolated cases.

The chairman of the subcommittee, withdrawing the report, said they had only published it to counteract the prevalent opinion that insured persons could only have the cheapest drugs and the cheapest appliances. The cases quoted were within the regulations and his committee had thought that the matter should be brought to the notice of the main committee.

OPPOSITION TO PAY BEDS.—At the conference of the National Association of Trade Union Approved Societies at Edinburgh recently complaint was made that "the movement to impose fees on admission into hospital and to reserve beds for paying patients is on the increase." A resolution was passed deploring the fact that "sick insured persons recommended for special treatment or operations in hospital are still subject to long waiting periods."

ROYAL LONDON OPHTHALMIC HOSPITAL.—The hospital is now being reconstructed and extended at a cost of £90,000. A year ago the prospect of beginning the work seemed remote, but through the King's Fund an anonymous donor offered £6000 if a similar amount could be raised, and this was accomplished. A further £25,500 is, however, still needed, and the same donor has offered an additional £4500 in the hope that the balance will be provided and the hospital reopened free from debt.

CORRESPONDENCE

THE POOR-LAW SICK WARDS

To the Editor of THE LANCET

SIR,—I should like to protest against the policy advocated by Mr. W. A. Bushell when in discussing the Municipal and Poor-law Service he says that the line of cleavage in classification is between the chronic sick and the acute sick, and that the chronic sick should be associated with the non-sick. In my view the cleavage is between the sick and the healthy, and the acute sick and the chronic sick should be placed together.

The ideal I have in mind is the large general hospital, using the word general in its proper sense, to describe a hospital in which patients suffering from almost all kinds of condition are treated. This requires an elaborate system of classification inside the institution, but the advantages of having the various classes under one administration are very great. It is now, I think, generally admitted that small special hospitals for acute cases are a mistake and that even maternity hospitals should be attached to general hospitals. There are good arguments for the inclusion of chronic patients in the same scheme. The plan is economical in every sense. Overhead expenses are spread over such a large number that they become a small factor in the cost per head, even if salaries are large enough to attract persons of good abilities. The staff can be large and diversified so that any condition that may arise can be treated by the appropriate specialist. A large staff is likely to be efficient; the members stimulate each other and the association is likely to engender those spiritual factors on which good medical work depends. Among the junior members of the staff the work can be spread out in due proportion, so that each has his share of acute and of chronic cases. The nursing can be done largely by probationers instead of "assistant nurses," who are neither fully trained nor in training, as experience in the nursing of chronic cases is most valuable training so long as it is balanced by the necessary experience in the nursing of acute cases. The conditions of general hospitals are much better for the chronic patients. It is a serious mistake to assume that chronic patients are of little importance and require no medical treatment. The condition of many of them can be greatly alleviated, or even so far cured as to allow of their discharge from hospital. It is by no means easy to secure efficient treatment for them. As a rule they are not stimulating, and their care requires higher qualities of mind than those sufficient for the treatment of the more obvious acute cases. In the general hospital from time to time a fresh eye will be turned to them; the diagnosis will be questioned and sometimes altered.

As Mr. Bushell admits, differences of opinion as to whether cases should be considered acute or chronic are common. This is of no great importance if all classes are treated in one hospital, but if the transfer of a patient to another institution is involved, these differences of opinion lead to serious friction. Every time a patient is transferred from one institution to another, an opportunity for conflict arises on the part of the patient himself, his friends, or the staff concerned, and in practical administration this is a serious matter. I am afraid that if Mr. Bushell's policy is generally applied, the result will be that we shall have set up under the councils hospitals for chronic patients with the faults of the old workhouse infirmaries.

I am, Sir, yours faithfully,

HENRY H. MACWILLIAM,
July 3rd. Medical Officer, Walton Hospital, Liverpool.

THE HOSPITAL ISOLATION OF SCARLET FEVER

To the Editor of THE LANCET

SIR,—Your leading article (June 10th) and Dr. Lillingston's letter (June 24th) deal with a matter of much practical importance—viz., the utility, or otherwise, from a public health point of view, of isolating scarlet fever cases in hospitals.

This supposed preventive measure was begun some half century ago, and it was primarily for scarlet fever—then, after small-pox, our most formidable infectious disease—that isolation hospitals (at first called "fever" hospitals) came into existence. At the beginning of this century I had just vacated the position of medical superintendent of the Birmingham City Fever Hospital, and carried out a statistical inquiry with a view to determining what results, if any, were being obtained from the hospital isolation of scarlet fever throughout the country. Returns, covering the period since hospital isolation of scarlet fever was begun, were obtained from most of the larger towns, and a comparison was instituted between those towns which had carried out the measure on a large scale—isolating a large proportion of the cases occurring—with those using the measure on a small scale or not at all. It was found that such a comparison failed to reveal any material advantage to the towns which had been using the measure most.

The results of this investigation were submitted to the Society of Medical Officers of Health in a paper entitled the Influence of Hospital Isolation in Scarlet Fever: An Appeal to Statistics (published in *Public Health*, April, 1901). The conclusions arrived at in this paper were that the hospital isolation of scarlet fever had failed to materially reduce either the attack-rate or case-mortality of the disease, and it was suggested, therefore, that an official investigation into the whole question should be instituted. These conclusions were opposed to existing teaching and belief, and the suggestion for an inquiry received little support. In due course, however—to be quite exact a quarter of a century later—the Ministry of Health did make such an investigation, and the result was embodied in a valuable report by Dr. A. C. Parsons, entitled "Some Administrative Aspects of Scarlet Fever." This was a voluminous document running into 369 closely printed pages! Possibly its very exhaustiveness accounts for the fact that it hardly received the attention and consideration it certainly deserved. Perhaps I may be allowed to quote from it.

The conclusions arrived at were cautious, but at the same time quite frank and explicit. Briefly, they were to the following effect:—

"*Length of stay in hospital.*—It appears reasonable to suggest, therefore, that in certain hospitals and in respect of uncomplicated cases a reduction in the traditional period of detention might be attempted without disadvantage. . . . Overcrowding in hospital wards certainly increases the dissemination of septic infection among patients. . . . We cannot satisfy ourselves that the discharge of patients from hospital in the late stages of desquamation constitutes a danger to public health.

"*The respective advantages and disadvantages of hospital and home treatment.* . . . The incidence of the disease to

the country generally appears to show no marked reduction as the result of hospital isolation. . : . The decline in the case-mortality and in the general mortality of scarlet fever began before hospital isolation became at all widespread and continued throughout all parts of the country irrespective of the difference in the quantity and quality of the hospital provision in these several parts.

"As regards the influence of fever hospitals or the incidence of complications, it is probably true that such complications are more quickly and more adequately treated than at home. But this is countered by others who maintain that the mixing of mild and severe cases of the disease in fever hospitals disposes to cross-infections with other diseases and to aggravation of scarlet fever infection in some who would have passed through a mild uncomplicated attack had they remained in the less dangerous company of their own family. . . .

"The number of scarlet fever patients, however, who clinically now require the benefit of hospital treatment form a very small proportion of those attacked. Never was there less epidemiological evidence nor less clinical necessity for the hospital isolation and treatment of scarlet fever patients than there is to-day, and yet the general hospital isolating-rate for the country as a whole was never so high as it is at the present time. It is a new situation and one which should be considered by the ratepayer and taxpayer alike. . . . Indeed, it may well be asked if the time has not come to consider whether much of the accommodation now set apart for mild cases of scarlet fever could not be better used for other kindred purposes. Considering their needs as patients, the subjects of pneumonia, measles, influenza, and encephalitis lethargica have often superior claims upon hospital care and treatment. . . . In truth, only a very small proportion of patients suffering from scarlet fever urgently require hospital treatment."

The report then proceeds to suggest that hospital treatment of scarlet fever should be reserved only for special cases—e.g., severe cases, or cases occurring in homes where milk-selling, clothes-making, &c., are carried on—or where there are several susceptible school-children.

As regards *disinfection*, the report draws attention to the fact that in certain towns where the practice of municipal disinfection after scarlet fever has been abandoned no bad results have been observed.

Here in Leicester we have, to a considerable extent, carried out the recommendations of the report. The average duration of stay in hospital has been brought down to 20 days—say, three weeks—without any untoward effect. The amount of accommodation reserved for scarlet fever has been reduced to a third of what was formerly considered necessary. Municipal disinfection has been much reduced—e.g., bedding is no longer removed to the steam chamber. Moreover, accommodation is now provided for other more important diseases—e.g., measles, whooping-cough, pneumonia, encephalitis, cerebro-spinal fever, erysipelas, and puerperal fever. Also, on one occasion when the hospital was required for major small-pox, all scarlet fever patients were sent home and no fresh cases admitted for some months, but without any increase whatever in the prevalence of scarlet fever.—I am, Sir, yours faithfully,

C. KILLICK MILLARD,
Medical Officer of Health.

Health Offices, Leicester, June 29th, 1933.

INTESTINAL TUBERCULOSIS

To the Editor of THE LANCET

SIR,—Dr. A. I. G. McLaughlin's paper (June 24th) provides an interesting summary of the lectures given at the Trudean School. Having worked at Saranac Lake in the Trudean Sanatorium subsequently to his visit, I venture to add a few comments.

After being regarded vaguely as tuberculous diarrhœa, intestinal tuberculosis was later the subject of pathological investigation, and its diagnosis has now reached a stage of precision through rœntgenological examinations. The figures of the Trudean School bear out the claims made by Brown and Sampson for this method of diagnosis, which is based on Stierlin's law that the normal cæcum is never empty when there is barium in the ileum or transverse colon. Of a series of 54 cases positive on X ray examination, 53 showed tuberculous enteritis at operation or autopsy. Of 32 cases negative on X ray examination, 7 showed tuberculous enteritis at autopsy. It should be remarked, however, that in these 7 cases the lesions were all confined to the small intestine, and this bears out the observation that the further the lesion is from the cæcum the less likely is it to show on X ray examination.

The suggestion of cod-liver oil and tomato juice cocktails is apt to produce smiles, but McConkey's figures are sufficiently suggestive to warrant a trial. I noticed that gaseous eructations were common at first, but soon passed off. If colourless tomato juice—not easily obtainable in this country—is used, and the cocktail is served ice cold, it is not unpleasant. It should be noted, however, that Fishberg, working in New York City, has not confirmed the claims of McConkey and Smith. He says ("Pulmonary Tuberculosis," vol. ii., p. 432), "Judging by our necropsy experience it is certain that it (tomato juice and cod-liver oil) has no influence on the ulcers at all." Nevertheless some patients languishing in the exile of the sanatorium develop a dread of "IT," and a simple method of treatment which offers possible protection seems justifiable. The mode of action of the cocktail treatment is unknown, but it is interesting to note that the factor common to heliotherapy, parenteral calcium chloride, and vitamin therapy is an effect on calcium metabolism.

I am, Sir, yours faithfully,

Liverpool, June 30th, 1933. C. ALLAN BIRCH.

EXPERIMENTAL PRODUCTION OF MALIGNANT TUMOURS

To the Editor of THE LANCET

SIR,—Dr. J. A. Murray's article in your issue of June 17th is an apologia for the experimental method in the field of cancer research. In its essence, and by the fact that it ignores evidence derived from human carcinoma, it appears as an assertion of the dominance of the experimental method over the slower methods of observation. It excludes entirely from consideration clinical and histological approaches to the same problem. Dr. Murray has doubtless wished to confine his paper to matters upon which he is the leading authority and concerning which he has first-hand knowledge, but there are other witnesses to be called on this question, and judgment must not be allowed to go by default. A reader of Dr. Murray's paper must not mistake it for the summing-up. It is the deposition of an important witness in defence of the experimental method of approach to the cancer problem, a method which has yielded important results and will yield more, but one which must not be exclusively exalted as the sole approach to the truth.

Reading between the lines, Dr. Murray would appear to be himself by no means satisfied with the results of experimental cancer research to date. He is only able to claim that the method can reproduce the clinical phenomena long familiar in human tar cancer. He admits that in other forms of human cancer no definite irritant can be demonstrated, but thinks that "it is reasonable" to accept the facts of experimental carcinogenesis as a model of the genesis

of these others also, an argument from analogy which is hardly distinguishable from pure hypothesis. He goes on to say that experimental carcinogenesis has defined the difficulties which still remain, and that we owe to it the material and methods by which they are being attacked. The experimental method does of course supply unlimited material for therapeutic trials. Nevertheless, Dr. Murray's claim is not a very high one because the persistence of the difficulties proves that the method of attack upon them has been hitherto unsuccessful.

When analysed Dr. Murray's statement is really a confession that the study of tar cancer in mice has not made the cancer process any more intelligible. The so-called irritation theory to which he pins his faith, as I have said elsewhere, merely restates in a more impressive form the fact that certain miscellaneous agents locally applied cause cancer and adds nothing to this knowledge. If tar, heat, X rays, nematode worms, and ultra-violet light are called irritants, then it is true to say that irritants may cause cancer, but this is a long way from the establishment of a general irritation theory of the disease.

The observational method of approach to the cancer problem must be taken into account, if only for the reason that in human cancer the experimental method cannot be applied. There is of course no real antithesis between the experimental and the observational methods, the proper antithesis is between the observation of an arranged event or process and the observation of an accidental or spontaneous event. In either case the sole significance of the event or experiment lies in the observations made upon it and their interpretation. The experimental method has the advantage in cases where the time period of a reaction is short, for it enables the reaction to be frequently observed and lends itself to confirmation by repetition and to the production of statistical evidence. This fact is a source of weakness as well as of strength. It is apt to lead to imperfect observation of the course of individual experiments and to undue exaltation of the value of statistics. Extensive observations of a large number of cases, with attention focused upon an end-result and its statistical expression, interfere with, and may actually preclude, the patient analysis of the course of events.

It may be asserted confidently that the recent history of cancer research exposes this weakness of the unassisted experimental method with its tendency to substitute repetition for analysis. Dr. Murray has described in detail the course of events in experimental tar carcinoma, but he has not analysed these events. In order to understand them the first requisite is a precise knowledge of the histological structure of the skin of the mouse, and particularly a knowledge of its lymphatic arrangements, but the experimentalists have given no attention to this subject.

Furthermore, the characteristic intermediate step to tar cancer is the production of papillomata. The experimentalists have blindly accepted this fact without inquiring how the papilloma is produced.

Until the recent work of Kreyberg, which demonstrated that the first changes produced by tar painting occur in the sub-epithelial tissues, the experimentalists assumed without investigation a direct and exclusive irritant action of the tar upon the epithelial cell. Dr. Murray's faith in the irritation theory still remains unshaken in spite of Kreyberg's work, and of the fact which he admits that in a large majority of human cancers no irritant in the ordinary sense can be demonstrated. His faith does not result from investigation, but is merely an assumption which has become an ingrained belief.

In my opinion the case of the failure of experimental carcinogenetics to throw a more definite light upon the nature of the cancer process is that experimentalists have attended only to an arbitrarily selected group of the phenomena which come under their ken, that they have not secured sufficient help from the basic sciences of anatomy and physiology, and that they have neglected to obtain guidance for their experimental efforts from the clear indications, obtained from the observational study of human precancerous tissues, that lymphstasis is the root cause of cancer, and that irritants merely act by producing lymph obstruction. In my judgment the most important new fact about cancer established in recent years is the blocking of the lymphatics in human precancerous tissues, a proven fact which invites experimental investigation in animals.

I am, Sir, yours faithfully,

W. SAMPSON HANDLEY.

Harley-street, W., July 4th, 1933.

MEASURING A HEALING ULCER

To the Editor of THE LANCET

SIR,—0 is the logarithm of 1. Dr. Brook's principle and figures would imply the formula: area of ulcer = $\frac{5}{(1{\cdot}25)^t}$ where t is the time in weeks. After 7·2 weeks the area would be about 1 square inch, and healing would not be complete till doomsday in the afternoon.

Assuming that the healing edge advances inwards at uniform speed from all points of the periphery, the formula for a rectangular ulcer would be: area of ulcer = (a—kt) (b—kt), where a and b are the original lengths of the two sides, t the time, and k a constant determined by the observations of the first week. For an elliptical (or circular) ulcer, a and b would be the long and short axes of the ellipse, and the formula would be multiplied by approximately 0·78. Healing would be complete when kt was equal to a or b, whichever was the smaller.—I am, Sir, yours faithfully,

Paignton, June 27th, 1933. ATHELSTANE HILL.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Lts. (D) H. A. Gunn, G. B. F. Reece, H. V. Pell, and L. V. Donegan are promoted to the rank of Surg. Lt.-Comdrs. (D).

ROYAL NAVAL VOLUNTEER RESERVE

The following appts. are notified: Surg. Lt.-Comdrs. J. B. Hutchison to *Effingham*; R. W. H. Tincker to *Victory*, for Haslar Hospital; and E. I. Puddy to *Hood*.

ROYAL ARMY MEDICAL CORPS

Maj. R. Gale to be Brevet Lt.-Col.

Lt. H. E. Hodge relinquishes his temp. commn.

The undermentioned Lts. (temp. commns.) to be Lts. (on prob.): D. A. Beattie and W. H. Hargreaves.

J. C. Reed to be Lt. (on prob.).

ROYAL AIR FORCE

J. L. Walsh is granted a short service commission as a Flying Officer for three years on the active list.

Dental Branch.—R. H. Marthews is granted a non-permanent commission as a Flying Officer.

HONORARY SURGEON TO THE KING

Lt.-Col. H. M. J. Perry, R.A.M.C., is apptd. Hon. Surg. to the King, and promoted Bt.-Col., vice Maj.-Gen. H. Ensor, late R.A.M.C. (ret.).

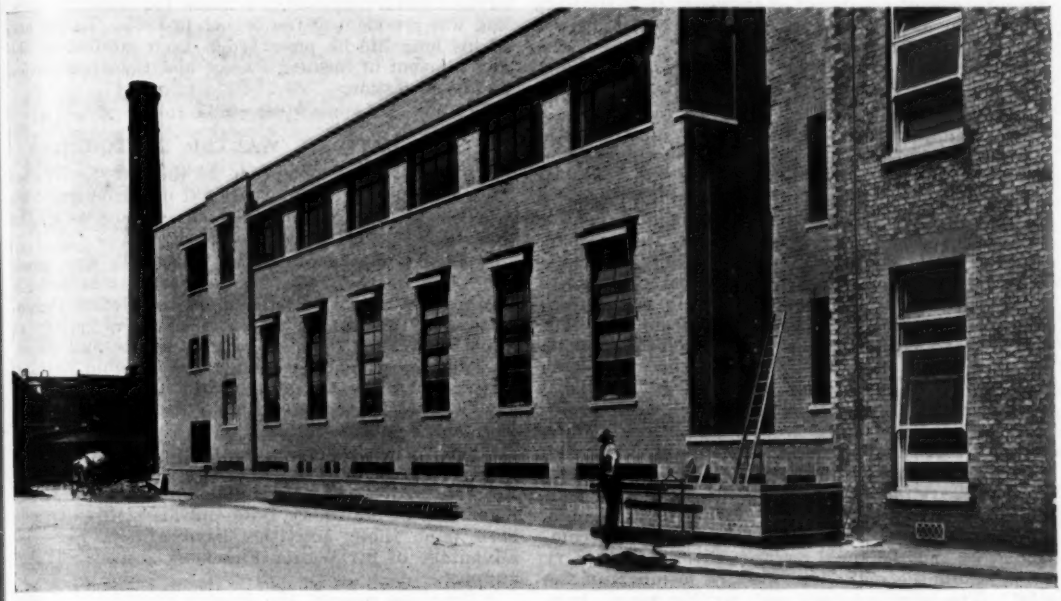

FIG. 1.—Exterior of the new Medical School buildings at King's College Hospital.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL

THE new buildings of the medical school of King's College Hospital were opened on Tuesday last by Prince George, who was received by the mayors of Lambeth and Camberwell, by the new chairman of the hospital committee of management (Lord Beatty), and by the dean (Dr. J. A. Drake). Among those presented to the Prince were the vice-chancellor of the University of London (Prof. L. N. G. Filon), the dean emeritus (Dr. Willoughby Lyle), the senior physician (Sir Charlton Briscoe), the senior surgeon (Mr. Arthur Edmunds), the chairman of the medical board (Mr. W. Gilliatt), and the architects (Mr. William Pite and Mr. Hubert Fairweather). After declaring the new buildings open the Prince inspected the school before proceeding to visit the hospital.

The new hospital was opened by the King in July, 1913, and a commencement was then made on the medical school; but the late war intervened and only a portion was opened in October, 1915. A loan of £11,000 had to be raised, but this was paid off by 1928, partly by the strenuous efforts of the then dean (Dr. Willoughby Lyle), and the school authorities began to set aside certain sums and to look forward to the completion of the buildings. With these sums and aided by a generous grant of £10,000 from the court of the University of London, together with another £7000 raised by Dr. Lyle, the school felt justified in commencing the new buildings in April, 1932. The completion of the school was

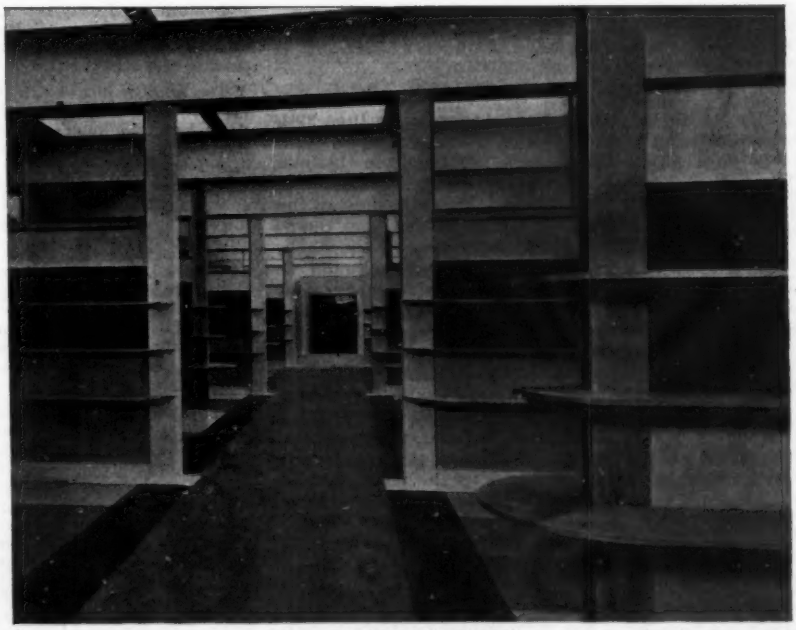

FIG. 2.—A view of the Museum.

urgently needed because of its growth from 55 students in 1915 to 320 in 1932, and a factor which helped towards this decision was the desire to help to alleviate the evil of unemployment in South London. Unfortunately, however, a building debt of approximately £5000 remains to be paid off.

The buildings, whose exterior is illustrated in Fig. 1, consist of a teaching museum, a dental museum, a biochemical research laboratory, lecture rooms of a size suitable for final tutorial and similar classes, a number of small research rooms, common rooms for students, and a new refectory hall. The museum (Fig. 2), while allowing a complete general view, is arranged in separate bays for classification purposes and for the instruction of students in the various branches of medicine, surgery, and obstetrics. The roof is so arranged that a maximum of light is obtained without direct sunlight. The biochemical research laboratory has been constructed on an additional floor over the original students' pathological laboratory, and the work in it will be run in conjunction with the reconstructed diabetic clinic of the hospital. The dental museum will provide all the accommodation necessary for the increasing number of specimens which are being collected by a growing dental school. The lecture rooms will provide much-needed accommodation, and the small research rooms will be very valuable for the individual work of members of the staff. The new common and writing rooms have been rendered necessary by the growth of the school, and these, together with the refectory hall, will provide ample accommodation. The refectory hall is provided with a stage, and valuable use can be made of it for special lectures and meetings, as well as for such events as the annual opening ceremony of the winter session.

It is anticipated that the buildings will provide for the requirements of the school for a good many years, and the architects (Messrs. W. A. Pite, Son, and Fairweather) and the builders (Messrs. Foster and Dicksee, Ltd.) are to be congratulated upon the design and execution of the work.

OBITUARY

JOHN FORD ANDERSON, M.D. Aberd.

BY the death of John Ford Anderson on June 29th the profession has lost a distinguished veteran. He was born at Boyndie, Banff, Scotland, in 1840, a son of the manse, his father being the Rev. A. Anderson, LL.D. He received his education at the Universities of Edinburgh and Aberdeen, and qualified L.R.C.S. Edin. in 1861, proceeding to the M.D., C.M. Aberd. two years later. As was common in those days among the ambitious students he took out a course of post-graduate work in Paris, and later settled in the North of London in general practice. He was the first lecturer on midwifery at the London School of Medicine for Women, an appointment which he accepted in 1875, and held for nearly 20 years. In the meantime his practice in Hampstead developed, and while private patients multiplied he found time to discharge many official posts. He was for long periods medical officer to the post office at Hampstead and to the Haverstock Hill provident dispensary, and physician to the Farringdon Dispensary and Lying-in Charity. He was particularly interested in the management of provident dispensaries, and wrote on their objects and practical utility, exemplifying the latter in his personal work. He was a member of the metropolitan counties branch of the British Medical Association for some 50 years, and was president of the branch in 1909. To the end of his long life he preserved a keen interest in the development of medical science and the organisation of his profession.

THE LATE SIR WALTER FLETCHER

THE following appreciation of the late Sir Walter Fletcher's service to international medicine has been received from Dr. Thorvald Madsen, director of the Statens Seruminstitut, Copenhagen:—

"Among the many who have felt the much too early death of Sir Walter Fletcher as a very painful loss must also be counted the Health Organisation of the League of Nations. In a variety of ways Sir Walter Fletcher gave us advice and assistance of important consequence, and I would particularly emphasise the interest which from the very first he took in the work that is being done by the Permanent Commission on Biological Standardisation. As you will be aware, some of its most important activities are concentrated in the National Institute for Medical Research at Hampstead, under the leadership of Sir Henry Dale and his highly efficient staff, and these activities have always had the advantage of Sir Walter Fletcher's active and able support.

"For these reasons the Health Organisation feels deeply indebted to him and will always cherish his memory."

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 24TH, 1933

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 8 (last week 18); scarlet fever, 1994 (last week 1771); diphtheria, 773; enteric fever, 37; acute pneumonia (primary or influenzal), 673; puerperal fever, 48; puerperal pyrexia, 79; cerebro-spinal fever, 28; acute poliomyelitis, 29; acute polioencephalitis, 1; encephalitis lethargica, 11; dysentery, 17; and ophthalmia neonatorum, 95. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 27th–28th was as follows: Small-pox, 39 under treatment, 1 under observation (last week 49 and 1 respectively); scarlet fever, 1771; diphtheria, 1610; enteric fever, 14; measles, 477; whooping-cough, 354; puerperal fever, 24 (plus 7 babies); encephalitis lethargica, 244; poliomyelitis, 0; "other diseases," 190. At St. Margaret's Hospital there were 19 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In 118 great towns, including London, there were no deaths from small-pox, 3 (0) from enteric fever, 29 (0) from measles, 3 (0) from scarlet fever, 13 (1) from whooping-cough, 22 (3) from diphtheria, 39 (7) from diarrhœa and enteritis under 2 years, and 18 (1) from influenza. The figures in parentheses are those for London itself.

The three deaths from enteric fever were distributed between Barnsley, Newcastle-on-Tyne, and St. Helens. Measles caused 8 deaths in Liverpool and 3 each in South Shields and Walsall. Four of the fatal cases of diphtheria were in Liverpool; there were also 3 in Kingston-upon-Hull and 3 in Brentford and Chiswick. Five deaths from diarrhœa and enteritis were reported from Liverpool, 3 from Brentford and Chiswick, and 2 each from Bradford, Manchester, Oldham, Birmingham, and Stoke-on-Trent.

The number of stillbirths notified during the week was 269 (corresponding to a rate of 39 per 1000 total births), including 41 in London.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

IN the House of Lords on Wednesday, June 28th, the Commons amendments to the Pharmacy and Poisons Bill were agreed to.

The Unemployment Insurance (Expiring Enactments) Bill and the Samaritan Free Hospital for Women Bill were read the third time and passed.

The Royal Assent was given to a number of Acts, including the Finance Act, the Pharmacy and Poisons Act, and the Unemployment Insurance (Expiring Enactments) Act.

On Thursday, June 29th, in the House of Lords, Lord JESSEL withdrew the University Spurious Degrees (Prohibition of Use and Issue) Bill. He explained that his reason for withdrawing the measure was that considerable objection had been taken to it on account of faulty drafting. Leave was granted to withdraw the Bill, and a new Bill on similar lines was introduced and read a first time.

Local Government Officers' Superannuation

On Wednesday, June 28th, the House went into Committee on the Local Government and Other Officers' Superannuation (Temporary Provisions) Bill. Sir D. HERBERT (Chairman of Committees) was in the chair.

On Clause 1 (Certain reductions in remuneration to be disregarded for purposes of superannuation),

Sir HENRY JACKSON moved an amendment to leave out "April 1932" and insert "October 1933." He said he thought it would be inequitable that officers whose remuneration was reduced for the first time on account of national economic conditions subsequent to April 1st, 1932, should be excluded from the provisions of this Bill. The Bill ought to cover cases in which reductions occurred for the first time since Oct. 1st, 1933.

Mr. SHAKESPEARE (Parliamentary Secretary to the Ministry of Health) said he could not accept the amendment. The object of this Bill was to make legal understandings entered into between local authorities and their employees, which were in fact illegal, but which at the time were made in good faith. They had chosen the period between Sept. 1st, 1931, and April 1st, 1932, because by that time the various associations had been informed by the Ministry that if any further agreements were made they were ultra vires, and that therefore local authorities who made such agreements after that date did so in the knowledge that they were breaking the law.

Mr. GREENWOOD said that this bombshell fell on local authorities towards the end of August, 1931. A large number of officers and servants agreed to a reduction of their salaries on condition that arrangements were made to deal with the problem of superannuation. If it was admitted that there was a case for Parliamentary intervention where local authorities acting in good faith had broken the law, it seemed to him that six months was too short a period. He hoped the Government were prepared to be reasonable on this matter, and allow a year for the completion of negotiations which were started as a result of the Government's policy.

Mr. ISAAC FOOT said he was sure it was the desire of the Government in carrying through this Bill to leave no rough edges.

Mr. M. BEAUMONT said that any local authority which embarked on these arrangements after the date proposed by the Government knew very well that they were doing an illegal action, and they ought not to be safeguarded.

The amendment was negatived.

Mr. GREENWOOD moved to insert after the word "understanding" in the clause the words "with the parties concerned." He said that he had an amendment later on to make it clear that officers or servants to whom the Asylums Officers' Superannuation Act, 1909, applied should be brought within the Bill. He understood that the Ministry of Health were prepared to consider the inclusion of these officers in the Bill, but there was some doubt as to whether an understanding arrived at between the Mental Hospitals' Association and those employed at mental hospitals was a bona-fide understanding within the terms of the Bill. Medical officers and nurses at mental hospitals were prepared to accept a reduction of salary when the Government came into office, but they naturally desired to protect their superannuation rights, and what he regarded as an understanding was reached. The employing authority, and those who served the employing authority, had asked to discuss the question with the Minister of Health, but that he had refused. If the spirit of this Bill was to operate the Government ought to include within its scope people in the mental hospitals' service. He hoped that the Parliamentary Secretary to the Ministry of Health would give an assurance that the understanding, as he regarded it, reached between the mental hospitals' authorities and their employees would be regarded as an understanding within the terms of this Bill.

Mr. SHAKESPEARE said he thought he could assure the right hon. gentleman that the asylum officers would be treated in exactly the same way as anybody else. They would be included in this Bill if in fact an understanding was made in good faith. He presumed that an understanding would have been reached between the visiting committees and their officers, and if that understanding was made in good faith the officers would come within this Bill. The right hon. gentleman's amendment would make it far more difficult for them to come in.

Replying to further questions by Mr. GREENWOOD,

Mr. SHAKESPEARE said that every fact would be taken into consideration. If agreements had been reached between national bodies that, of course, would be evidence that there was an understanding; but local agreements where they existed would be considered too in deciding whether individual persons came under the Bill.

Mr. GREENWOOD said that Mr. Shakespeare had pushed the responsibility back on to the individual visiting committees. His (Mr. Greenwood's) original case was that the Mental Hospitals Association, which represented the majority of mental hospital authorities in this country and certain national bodies, including the British Medical Association, did arrive at an understanding. Now they were told by the Parliamentary Secretary to the Ministry of Health that it would be a matter for each visiting committee and he wanted to know whether an agreement was an agreement when it was national, or only when it was local. The answer that it might be both did not help very much. If Mr. Shakespeare would look into this matter before the Report stage of the Bill he would not press the point any further at that stage.

The amendment was withdrawn.

Captain ELLISTON moved an amendment the terms of which he said would enable local authorities to reconsider their position in regard to the Bill, and if it was right and proper adjust the superannuation cut in the case of those officers whose pensions they wished to secure. He had heard something of the circumstances in which the Association of Mental Hospital Workers were placed. On the publication of the original memorandum of the Ministry of Health, No. 1122, in September, 1931, that Association met to see whether they could suggest any reduction, and consulted the British Medical Association and the Royal Medico-Psychological Association, and other bodies interested, and submitted a scale of reductions which was welcomed by the visiting committees. The Ministry of Health pointed out that subject to the amendment of the Asylum Workers' Superannuation Act the pensions must be based on the actual salary paid. The Association passed on that warning

to the local authorities, and out of 66 hospitals outside London, advised by that Association, 9 made no reductions and were therefore not affected by this Bill; 24 of the hospitals, anxious to safeguard the pension rights of their officers, and seeing what other authorities were doing, continued, in spite of the Ministry's warning, to make superannuation deductions based on the original scale; 27 other hospitals, who wished to do the right thing, acted on the advice of the Ministry. The position under the Bill would be that those hospitals which defied the Ministry were to be whitewashed or indemnified, while the 27 which felt themselves bound to act in accordance with the Ministry's advice would be outside the terms of the Bill. This would be a big injustice, and he hoped that his amendment would be accepted.

Mr. SHAKESPEARE said he was particularly sorry not to be able to accept the amendment because he knew the interest which the hon. Member took in these cases. The amendment, however, cut at the principle of the Bill which was non-contentious. The amendment would bring in cases of cuts which were not made on the understanding that they should not affect pensions, but were made with the knowledge that the cut or lower pay must be followed by lower pensions. Another reason which made the amendment unacceptable was that the principle was applied first to personal pension which was against the principle of all Superannuation Acts.

The amendment was withdrawn, and the Bill passed through Committee and was reported to the House.

Department of Mines

On Thursday, June 29th, the House of Commons went into Committee of Supply on the Civil Estimates, Sir D. HERBERT in the chair.

On a vote of £204,079 for the salaries and expenses of the Department of Mines,

Mr. E. BROWN (Secretary for Mines) said the estimate showed a decrease of £14,516 compared with the last year's figures. Dealing with the questions of health and safety in the mines, Mr. Brown said that they gave rise to two problems—that of underground lighting and that of minimising the casualties due to falls of roof. The fatal accident rate rose slightly from 859 in 1931 to 881 in 1932, and serious non-fatal accidents fell from 3305 in 1931 to 3212 in 1932, when the figure was the lowest on record. It was difficult to see how effective and general action could be taken in regard to underground lighting apart from general regulations. With regard to falls of roof, the Department would do everything possible to see that the research work which had been carried out bore fruit as soon as possible.

The debate on the vote was adjourned.

A Prisoner's Mental Condition: Criticism of Medical Officer

On Friday, June 30th, the House of Commons went into Committee of Supply on the Civil Estimates. Sir D. HERBERT (chairman of committees) was in the chair.

On a vote of £5,141,915 to complete the sum necessary for the salaries and expenses of the police in England and Wales,

Sir JOHN GILMOUR (Home Secretary) said a large part of the time of the police was taken up with minor offences, such as traffic offences, most of which were connected with motor-cars. In fact these accounted for 43 per cent. of all the criminal proceedings taken in 1931. Except for these traffic offences there had been in recent years a decrease in almost all classes of non-indictable offences, including drunkenness, assault, begging, sleeping-out, and offences against the poor-law. It was gratifying that there was, broadly speaking, an improvement in the general social conditions and social behaviour. There had also been a decrease in the gravest forms of crime, such as those involving the taking of life. There had been no increase over the past 20 years. The total number of persons killed in traffic accidents in Great Britain in 1932 showed a slight fall, being 6667 as against 6691 in the preceding year. The total number of persons killed or injured was 213,117, as against 208,810. There was a drop of nearly 200 in the number of persons killed in accidents attributed to mechanically propelled vehicles; this, on the other hand, was nearly counterbalanced by the increase in the number of persons killed in accidents attributed to pedal cycles. It was clear that a great majority of these accidents must have been preventable by the exercise of greater care on the part of motorists and pedestrians. After further debate the vote was withdrawn.

On a vote of £445,063 to complete the sum necessary for the salaries and expenses of the Prison Commissioners and of the Prisons in England and Wales,

Brigadier-General SPEARS called attention to the case of Thomas Parker, aged 34, who died in Winson Green prison on June 2nd. This man, who was destitute, was arrested for sleeping out and was sent to prison for 14 days by two magistrates of the Coleshill Bench. Parker went to prison quietly and gave no trouble, but a warder noticed that he would not keep his cell door closed, although repeatedly told to do so. During the second night of his imprisonment he was disturbed and agitated and kept on shouting that he had committed no crime and that he must get out of gaol, even if it was in a coffin. At exercise next morning Parker fell out, said he was done, and from then onwards he behaved like a man in a frenzy. The acting governor sentenced him to three days solitary confinement on bread and water. The prison doctor, at the inquest, stated he noticed in the warder's report that he had to close Parker's door on certain occasions and that Parker seemed to have had some reluctance to having the door closed. Brigadier-General Spears quoted from a newspaper the statement of the medical officer that Parker might have been suffering from claustrophobia, though he had given a certificate that he was in a fit condition to undergo solitary confinement, and he (Brigadier-General Spears) pointed out that the doctor's evidence was in contradiction to the answer which Mr. Hacking (Under-Secretary to the Home Office) had given to him (Brigadier-General Spears) the other day, when questioned about Parker's case. To make matters doubly sure he also consulted a great London alienist and laid the evidence he had before him. The alienist said that there was no doubt that this man was suffering from some form of claustrophobia. The acting governor of the prison, armed with the doctor's certificate, condemned Parker to three days solitary confinement. He was no doubt applying the regulations and carrying out his orders as a non-commissioned officer would do, inexorably and mechanically. Some men would have taken into consideration the fact that this man's crime was only that of not having a roof above his head, and would have investigated what the mental condition of the man was. During the short journey from the adjudication-room to the silent cell Parker was so injured that within a quarter of an hour or so he was dead. No one actually saw him fall. The warders released his arms for a moment and Parker took a flying jump forward down a flight of stone steps. He landed at the foot of the steps in a spread-eagle fashion and then struggled up on his knees. He received a terrible injury at the back of the head behind the ear. He was taken to the cell and the next time he was looked at it was found that he was dead. He (Brigadier-General Spears) begged the Government to consider whether this story did not lead to the conclusion that the administration of Winson Green prison required investigation. Above all did they not think that the Vagrancy Act ought to be repealed?

Sir FRANCIS FREMANTLE said that it must be realised that the governors of prisons had an immensely difficult task. They had to consider the real facts of the case. Brigadier-General Spears had

talked of claustrophobia, but he (Sir F. Fremantle) imagined that everyone would recognise the danger of carrying things too far if that description were applied to the objection of every prisoner to being shut in a cell. Medically speaking the word claustrophobia, like many of the terms used in psychological medicine, had an indefinite meaning; its general meaning was very clear, but it was indefinite. One could not define it clearly except by a general assessment of the individual's honesty in explaining his feelings, being able to analyse them himself, and to communicate them to the medical man examining him. It was extremely difficult to be sure of that condition in a person. There was the greatest danger in bringing claustrophobia into legislation, if only because there was some claustrophobia in the case of every prisoner. What was required was a very close supervision of prisoners, especially those of nervous temperament, during the whole time they were in prison without waiting until they complained of one particular trouble or another.

Earl WINTERTON asked whether Sir F. Fremantle thought it was probable that an injury of such a kind as that which caused this man's death would not have been noticed by two or three people who were standing near when he fell.

Sir FRANCIS FREMANTLE said that it depended entirely on the nature of the injury. In the Army the commanding officer was responsible for the health of his troops, and not the medical officer. The commanding officer who was responsible had to take the advice of the medical officer and decide how far he would accept that advice. What he (Sir F. Fremantle) wanted to know was whether the governor of a prison was in a similar position, or did he think that it was a question solely for the medical officer? He thought that the only proper rule of supervision, whether in the prisons or in the army, was for the layman to be responsible, though he might take the advice of the medical officer. He was afraid that there were some prisons—Winson Green prison might be one of them—where the governors did not recognise it as their duty to be in active and constant touch with medical officers and to give the medical officers as much latitude as possible in carrying out their difficult job of supervising the condition of the prisoners and reporting upon it. Was there any scheme for insisting on some kind of training of prison governors in the main outlines of the care of health and mentality? The new line of thought which had developed during the last 10 or 20 years as to the necessity of understanding the physical and mental health of individuals before efficient work or behaviour could be expected from them was a line of progress that must be brought into our prison management. The case before the Committee offered a good opportunity to raise questions which had a far wider bearing.

Mr. HACKING (Under-Secretary to the Home Office) said that his information was that Parker, after he got into prison, was unruly and almost violent practically the whole of the time. It was true that the behaviour of this man might have been an indication of claustrophobia; but the prison doctor said quite clearly that in his opinion this complaint was not the cause of the man's death. Cases of this kind were not at all uncommon, and it was exceedingly difficult to diagnose. The medical officer did not state that the prisoner suffered from claustrophobia, nor did he suspect it, nor was there any reason to suspect it. With regard to Sir F. Fremantle's question the governor of any prison was of course responsible for the health of the prisoners, but naturally he accepted the advice of one who knew a great deal more about health matters than he could possibly do, and he was always guided in such matters by the prison doctor. A governor, for example, did not sentence a prisoner to punishment unless the medical officer certified that the prisoner was fit for the punishment.

Sir FRANCIS FREMANTLE asked whether the governor similarly gave weight to the opinion of his medical officers as regarded the mental psychology of the prisoners.

Mr. HACKING said that certainly the governor of a prison did so, as was done in this case. The evidence on which the mental specialist consulted by Brigadier-General Spears based his opinion was apparently brought to his notice after Parker was dead. It was not previously in the possession of the prison medical officer who on hearing it agreed that claustrophobia was a possible explanation of Parker's frenzy. But he had previously had no reason to suspect such a condition. The coroner's jury came to the decision that the cause of death was accidental; there was no rider and no blame was attached to anyone. While having every sympathy with the man's relatives he (Mr. Hacking) could not see that any further action was necessary or desirable.

Sir FRANCIS FREMANTLE: Are there any qualifications demanded on the appointment of governors or deputy governors with regard to seeing that they have some elementary knowledge of health conditions, sanitation, and psychology?

Mr. HACKING: Not as a general rule, although some governors have special knowledge. Continuing, the hon. Member said that he did not think it would be right to lay it down that a man should be disqualified from taking a position of this sort because he did not possess special knowledge of medical subjects.

Sir FRANCIS FREMANTLE said he did not ask for pecial knowledge.

Mr. HACKING said that after all the governors had advisers, the medical officers, and they were right in accepting the advice of a man who had real specialist knowledge, especially in cases of this kind.

After further debate, progress was reported.

HOUSE OF COMMONS

WEDNESDAY, JUNE 28TH

Committees and Commissions

Mr. HORE-BELISHA (Financial Secretary to the Treasury) informed Mr. GROVES that, excluding Standing and Statutory Committees, &c., there were 23 Committees and Commissions still sitting. Among them were the following: Committee for the codification of the law relating to income-tax (appointed October, 1927); *Committee to inquire into the recruitment, &c., of Local Government officers (appointed September, 1930); *Committee to inquire as to the inclusion of turpentine poisoning and papilloma among industrial diseases entitling to workmen's compensation (appointed November, 1930); Committee to consider the grouping of enactments in relation to Local Government and Public Health law consolidation (appointed December, 1930); *Committee to investigate the cause of the shortage of officers and nurses in the medical and dental branches of the defence services (appointed May, 1931); Committee to make recommendations as to the future development of garden cities (appointed July, 1931); *Committee to consider the causation of mental disorder and the value of sterilisation as a preventive measure (appointed June, 1932); Committee to inquire into precautions against overwinding in mine shafts (appointed February, 1933); *Committee to consider methods of securing proper standards of fitness in working-class houses and promoting the supply of such houses (appointed March, 1933).

The committees marked with an asterisk might be expected to present their reports in the course of the present year.

Dummy Corpse as Warning to Motorists

Sir GIFFORD FOX asked the Minister of Transport whether his attention had been called to the action of the police at Reigate in exhibiting two overturned motor-cars and a dummy corpse as a warning to motorists; and whether, in view of the possibility that such action might make many new drivers nervous and thereby cause more accidents than it would prevent, he would discourage

such action in future.—Sir JOHN GILMOUR replied: I have obtained a report from the chief constable of Reigate, who informs me that the exhibition in question was organised by the local branch of the National "Safety First" Association, of which the chief constable is hon. secretary. The exhibition formed part of an extensive programme of safety first displays held in connexion with the safety first week at Reigate from June 5th to 10th. The exhibition consisted of one or two old motor-cars placed at certain sites off the main road on which posters and other matter advertising the safety first week were fixed. A similar exhibition was given last year, and the chief constable states that no reports were received that anyone was alarmed or shocked by the display. This year a firm of press photographers, without authority and before the representation was complete, used the opportunity to take and publish a photograph of a person lying near the scene and posed as if injured as the result of the accident. This was no part of the exhibition organised by the Association, and I join with my hon. friend in deprecating the action taken.

THURSDAY, JUNE 29TH

Ambulance Service and Boundary Restrictions

Mr. DORAN asked the Minister of Health if he was aware that local arrangements for the use of an ambulance did not permit an ambulance to render aid, even in the case of a serious accident, in an adjoining district; and if he would call a conference of all the metropolitan and local authorities concerned with a view to legislation to put an end to the present conditions which endangered the life of an injured person.—Sir E. HILTON YOUNG replied: I am not aware that the position generally throughout the country is as stated in the first part of the question. I am causing inquiries to be made into the circumstances of the case recently reported in the press in which difficulty arose, and I will consider whether any general action is necessary.

Rents of Council Houses

Mrs. WARD asked the Minister of Health whether he was aware that a disparity existed in many local government areas between the rents charged by the local authorities for houses recently erected by them and for those erected by them some time ago; and whether, with a view to removing the dissatisfaction caused thereby, he would consider the desirability of issuing a departmental circular to local authorities recommending that by a method of pooling, or otherwise, they should render such rents as uniform as could practically be done.—Sir E. HILTON YOUNG replied: The reply to the first part of the question is in the affirmative, the disparities resulting in part from variations in building cost and in part from differences in the conditions prescribed by the several Acts under which subsidies are payable. Such a pooling of rents as is suggested in the second part of the question would involve the raising of rents which are at present low as well as the reduction of rents which are at present high, and in view of the needs of the less well-paid working-classes I should not be prepared to encourage a general arrangement of this kind. Circular letters have already been issued to local authorities which deal with this matter.

Motor Accidents and Emergency Treatment

Mr. JOEL asked the Minister of Transport whether he would consider raising the charge for motor driving licences from 5*s.* to 7*s.*, earmarking the extra 2*s.* for hospitals to reimburse them for the cost of road accidents; and whether he would in any case investigate the financial effects of such a proposal.—Lieut.-Colonel HEADLAM (Parliamentary Secretary to the Ministry of Transport) replied: Proposals on the lines of that contained in the first part of my hon. friend's question have been made from time to time, and most recently in a debate in the House of Lords on June 22nd, on the occasion of the second reading of the Road Traffic (Emergency Treatment) Bill, as a result of which the Bill now stands referred to a Select Committee. My hon. friend will carefully consider any report that the Committee may make.

Causes of Colliery Explosions

Mr. TOM SMITH asked the Secretary for Mines how many public inquiries were held by his department during 1930, 1931, and 1932 into the loss of life due to explosions; and how many prosecutions were instituted as a result of the inquiries.—Mr. ERNEST BROWN replied: During the years 1930, 1931, and 1932, 11 public inquiries were held, under Section 83 of the Coal Mines Act, 1911, into the causes of colliery explosions. Such inquiries are held, as the Act directs, for the purpose of determining the cause and attendant circumstances of the explosion. Any necessary investigations as to alleged offences against the Act are made by H.M. Inspectors, whether a public inquiry is instituted or not; and in respect of one of the explosions which was the subject of a public inquiry, legal proceedings were taken against the colliery management.

Houses Completed with State Assistance

Mr. PRICE asked the Minister of Health if he would furnish a return showing for the years ended March 31st, 1932 and 1933, separately, the houses completed by local authorities with State assistance, by private enterprise with State assistance, and without State assistance, respectively.—Sir E. HILTON YOUNG replied: The following is a statement showing the number of houses completed in England and Wales during the years ended March 31st, 1932, and March 31st, 1933:—

Year ended—	Number of houses completed.*		
	With State assistance.		Without State assistance.
	By local authorities.	By private enterprise.	
March 31st, 1932 ..	67,576	2,333	130,903
„ „ 1933 ..	54,566	2,493	143,437

* Excluding houses of a rateable value exceeding £78 (£105 in the Metropolitan area).

MONDAY, JULY 3RD

Air Ambulance Service in the Highlands

Mr. KIRKWOOD asked the Secretary of State for Scotland if he would bring before the Department of Health the advisability of organising an air-ambulance service for the conveyance of urgent medical and surgical cases from the Hebrides and Western Isles to the hospitals and infirmaries in Glasgow; and if he would consider the advisability of arranging a scheme with the Saint Andrews Ambulance Association and the Highland Medical Service, so that there could be coöperation.—Mr. SKELTON (Under-Secretary of State for Scotland) replied: The suggestion contained in the question involves a number of practical difficulties which would require most careful consideration before its adoption.

DISPOSAL OF LONDON REFUSE.—Speaking on June 30th at a luncheon of the Advisory Committee on London Refuse, Sir Hilton Young (the Minister of Health) said that he must strike a warning note about the hills of refuse which were being accumulated on the outskirts of London at the rate of about a million tons a year. Unless the work was properly done, these hills of refuse would become a sanitary danger. In the past the work had not been properly done in all cases; he could not say that it was being properly done in all cases even now. There was also room for improvement in the methods of collection. The primary responsibility was with the 28 metropolitan boroughs and the London corporation, and they had to coördinate their work with the authorities of the districts round London where the refuse was tipped. Most certainly some coördinating authority was necessary, and the hope was that the advisory committee would achieve the necessary improvements by voluntary coöperation.

MEDICAL NEWS

University of Oxford

At a recent examination for the degree of M.Ch. Mr. A. E. Porritt was successful.

May Fellowship and Readership in Medicine.—The electors to this readership have appointed Dr. Alexander Macdougall Cooke as May Fellow and reader in medicine to hold office until 1935.

University of Birmingham

At a congregation held on July 1st the following degrees were conferred :—

M.D.—F. H. Healey.
Ch.M.—William Gemmill and Bertram Lloyd.
M.B., Ch.B.—(Second-class Honours): D. M. Brown and C. S. Whitehouse (distinction in surgery). Pass degree: H. C. Aston, G. R. Clarke, A. C. Edwards, R. E. P. Field, J. G. H. Frew, Albert Hemming, James Montgomerie (distinction in Medicine), Emma D. N. Part, F. J. Rutter, W. P. Stevens, and J. L. Whatley.

Dr. C. W. Forsyth has been appointed lecturer in mental diseases, Dr. C. F. V. Smout demonstrator in anatomy, and Mr. R. K. Debenham lecturer in general surgery to dental students.

University of Edinburgh

Among those who received the honorary degree of LL.D. at the graduation ceremonial of this University on June 30th was Sir Henry Dale, director of the National Institute for Medical Research and secretary of the Royal Society; Sir Alexander Houston, director of water examinations for the Metropolitan Water Board; and Sir Hugh Arthur Rose, chairman of the General Board of Control for Scotland. The degree of D.Sc. was conferred on Mr. B. P. Wiesner, Ph.D.

University of Glasgow

On June 30th the degree of Ph.D. was conferred on Dr. W. A. Burnett.

University College, Cork

At recent examinations the following candidates were successful :—

M.D.

J. D. O'Riordan and R. C. Webster.

M.B., B.CH., B.A.O.

J. J. Linehan (Second-class Honours), J. S. Kelleher, M. F. Kelleher, and J. G. O'Sullivan.
Part I. only.—C. J. Cantillon, P. J. Geoghegan, H. L. Lentin, and J. P. O'Leary.
Part II. only.—Michael Flavin.

D.P.H.

Mary C. O'Connell.

A Conference on Cremation

The second joint conference of the National Association of Cemetery and Crematorium Superintendents and the Federation of Cremation Authorities in Great Britain will be held in London from July 10th to 13th. Lord Horder will give the opening address, and on the last day of the conference Dr. W. M. Willoughby, medical officer of health for the City of London, will preside. The secretary of the conference is Mr. C. L. Hilton, Brockley Cemetery Office, London, S.E. 4.

British Post-graduate Medical School

As announced in our last issue the foundation-stone of the new buildings of this school, at the London County Council Hospital, Ducane-road, Hammersmith, will be laid on July 17th by the Chancellor of the Exchequer. The scheme of which they form part was recommended by the Post-graduate Medical Education Committee appointed by Mr. Neville Chamberlain in 1925. The Government have agreed to contribute a maximum of £100,000 for the building and equipment of the school, and the L.C.C. has agreed to incur an equivalent expenditure on such developments and adaptations of the hospital as are found to be necessary at the present time in view of its forthcoming association with the school. The Government have also undertaken to provide in due course for annual grants towards the maintenance of the school as part of the University of London. The chairman of the governing body is Sir Austen Chamberlain.

Lincoln's Inn

Among those called to the Bar on June 28th was Dr. L. F. Beccle.

Eugenics Society

At a meeting of this society, to be held at 5.30 P.M. on Tuesday, July 18th, at the rooms of the Royal Society, Burlington House, Piccadilly, London, W., Mr. A. M. Ludovici will speak on Eugenics and Consanguineous Marriages. Sir Humphry Rolleston will preside.

Fellowship of Medicine and Post-Graduate Medical Association

There will be a demonstration of X ray films by Dr. Peter Kerley on Thursday, July 13th, at 4 P.M., at the Medical Society of London, Chandos-street, Cavendish-square, W. Three-quarters of the time will be given to radiograms of the chest and heart, and a quarter to radiograms of the intestinal tract. In the absence of special courses attention is called to the individual clinics which are available daily by special arrangement with the Fellowship. A list of these clinics can be obtained on application from the secretary of the Fellowship, 1, Wimpole-street, London, W.1.

R.M.B.F. Society of Ireland

The annual meeting of the Royal Medical Benevolent Fund Society of Ireland was held in Dublin on June 28th. The report of the council showed that there was a slight increase in the number of subscribers but a decrease in the amount of the subscriptions. Owing to this decrease it had been found necessary to reduce the several grants by 10 per cent. Many speakers commented on the apathy of a large number of medical men throughout the country. In some counties almost every medical man subscribes, while in others, and those not the poorest, there are only one or two. Many of the appeals that come before the council are pathetic in the conditions they disclose (writes our Dublin correspondent), and even the 10 per cent. reduction in the grants this year will cause hardship to many aged medical men or the dependents of medical men. Ninety-four grants were made during the year, the recipients being 69 widows of medical men, 17 orphans, and 8 medical men.

Central Middlesex County Hospital, Willesden

In declaring open the new children's wing and electrical department of this hospital on June 30th, Sir George Newman said that 25 years ago it would have been impossible to have found such a hospital outside Germany or America. He complimented the guardians and the county council on the work they had done in transforming a poor-law hospital into a public hospital serving a great community. He related how the poor-law hospitals had grown out of the poor-law infirmaries initiated by King Alfred for the sick and leprous poor, and how now they in their turn are being transformed into what he described as hospitals "designed by the people of the people for the people." The new wing is three storeys high, and in addition to 30 separation wards it contains 12 main wards, each for 6 beds, and 3 day rooms. All the windows and the verandah on the ground floor are glazed with vita glass. The sanitary fittings are placed in towers at the back of the main block, and the main staircase and the electric bed lift continue up to the flat roof, which is specially arranged for sun treatment. The heating is by low pressure hot water, and on the ground floor the radiators are supplemented by ceiling panel heating. The electrical department is a one-storey building containing an X ray room, viewing room, office, and film store. The large treatment room is divided by curtains into nine cubicles and a doctor's room. There are also a preparation room, a waiting room, and lavatory. The total cost of both buildings is approximately £45,000. Sir George Newman declared himself abundantly satisfied with this expenditure—not only in his capacity of civil servant but also as one of the ratepayers of the county.

The medical superintendent of the hospital is Dr. W. E. Turner.

Dr. Percy Stocks, who is at present reader in medical statistics in the University of London, at University College, has been appointed medical statistical officer in the General Register Office.

Memorial to a Birmingham Surgeon

Last week a bed in the Birmingham and Midland Hospital for Women was dedicated to the memory of the late Mr. Christopher Martin, for many years honorary surgeon. The bed is in the ward named after him, and a tablet at its head records that it was "endowed by friends and patients of the late Mr. Christopher Martin in happy appreciation of his life and service."

Lectures on Tropical Hygiene

The next series of eight lectures and demonstrations on tropical hygiene, which are intended for men and women outside the medical profession proceeding to the tropics, will be given by Lieut.-Colonel G. E. F. Stammers daily from July 10th to 19th (11 A.M. to 12.30). The synopsis and other particulars may be had from the secretary of the London School of Hygiene and Tropical Medicine, Keppel-street, Gower-street, W.C. 1.

Order of the Hospital of St. John of Jerusalem

The following promotions and appointments among medical men to the Venerable Order of the Hospital of St. John of Jerusalem have received Royal sanction:—As Knight of Justice: Major-General Lord Dawson of Penn. As Knight of Grace: Major-General J. T. Fotheringham, Colonel Sir Edward Newbury Thornton. As Commander: Lieut.-Colonel W. K. Clayton, Dr. H. W. Horan, Dr. S. McCormac, Dr. H. A. Beatty, Col. Lorne Drum, Major-General Sir John Wallace D. Megaw, I.M.S., Dr. Arthur Dobson. Officer: Dr. James Cairns, Dr. Christopher Armstrong, Major James H. Dixon, Brevet Colonel J. Wallace, Dr. E. A. Braithwaite, Lieut.-Colonel O. A. Cannon, Colonel J. T. Clarke, Lieut.-Colonel G. G. Corbet, Dr. A. J. Douglas, Dr. R. Millar, Dr. G. D. Stanley, M.P., Lieut.-Colonel A. McP. Warner, Dr. R. E. Wodehouse, Dr. R. A. Worthington, Dr. A. T. Macnamara, Captain F. H. R. Heath, Dr. S. L. Dawkins, Captain M. G. Louisson.

Vacancies

For further information refer to the advertisement columns

Accrington Victoria Hospital.—H.S. £150.
Ashton-under-Lyne, District Infirmary.—H.S. At rate of £150.
Bangor, Carnarvonshire and Anglesey Infirmary.—Sen. and Jun. H.S. £150 and £100 respectively.
Beckenham, Kent, Bethlem Hospital, Monk's Orchard.—Res. H.P. At rate of £150.
Birmingham and Midland Eye Hospital, Church-street.—H.S. £130–£150.
Birmingham, Selly Oak Hospital.—Cas. O. At rate of £200.
Blackburn Royal Infirmary.—Res. H.P. £175. Also Fourth H.S. £150.
Bolingbroke Hospital, Wandsworth-common, S.W.—H.P. At rate of £120.
Brentwood, Essex, High Wood Hospital for Children.—H.P. £80.
Bristol General Hospital.—Two H.P.'s, Two H.S.'s, &c. All at rate of £80.
Brook (Fever) Hospital, Shooter's-hill, S.E.—Res. Med. Supt. £1000.
Burnley Municipal General Hospital.—Jun. Res. M.O. £150.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
Cardiff City.—M.O.H. £1200.
Cardiff, Royal Hamadryad Seamen's Hospital.—Res. M.O. £650.
Cardiff, Royal Infirmary.—Hon. Dental Surgeon. Also H.S. to Obstetric Dept. At rate of £50.
Central Histological Laboratory, Archway Hospital, Archway-road, N.—Histologist, Grade II. £750.
Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £150.
Coventry and Warwickshire Hospital.—Res. Cas. O. £125.
Edinburgh, Department of Health for Scotland.—Two M.O.'s. Each £600.
Edinburgh, Gogarburn Certified Institution, Corstorphine.—Res. H.P. At rate of £100.
Enfield, Education Committee.—School Dental Surgeon. £500.
Evelina Hospital for Sick Children, Southwark, S.E.—H.S. At rate of £125.
Great Yarmouth General Hospital.—H.S. £140.
Guildford, Royal Surrey County Hospital.—H.S. £150.
Halifax, St. Luke's Hospital.—Jun. Res. M.O. £250.
Hammersmith Hospital, Ducane-road, Shepherd's Bush, W.—Asst. M.O. £350.
Hampstead General and North-West London Hospital, Haverstock-hill, N.W.—H.P. Also Cas. M.O. for Out-patient Dept. Each at rate of £100.
Hôpital et Dispensaire Français, Shaftesbury-avenue, W.C.—Hon. Asst. Surgeon.
Hospital of St. John and St. Elizabeth, 60, Grove-End-road, N.W.—Res. H.P. At rate of £100.
Huddersfield Royal Infirmary.—Two H.S.'s. Each at rate of £150.
Huddersfield, West Riding Mental Hospital, Storthes Hall.—Asst. M.O. £350.
Hull Royal Infirmary.—H.P. for Sutton Branch. At rate of £160. Also Cas. O. and H.S. to Ophth. and Ear, Nose and Throat Dept. Each at rate of £150.
Ilford, Borough.—Asst. M.O. £500.
Ilford, King George Hospital.—Hon. Surgeon to Ear, Nose and Throat Dept.
Infants Hospital, Vincent-square, Westminster.—Robert Mond Research Studentship. At rate of £100. Also Asst. Ophth. Surgeon.
Kingston-upon-Hull, Anlaby-road Institution.—Asst. M.O. £350.
Lancaster Royal Infirmary.—Part-time Radiologist.
Leamington Spa, Warneford General Hospital.—Res. Cas. H.S. and House Resident to Spec. Depts. £150.
Leicestershire and Rutland Mental Hospital, Narborough.—Asst. M.O. £350.
Lewisham Hospital, High-street, Lewisham, S.E.—Asst. M.O. £350. Also H.P. £80.
Liverpool, David Lewis Northern Hospital.—Cas. O. At rate of £120. Also four H.S.'s and two H.P.'s. Each at rate of £80.
Liverpool Hahnemann Hospital, Hope-street.—Stipendiary M.O. At rate of £125.
Liverpool Heart Hospital.—Asst. Physician. £200.
Liverpool Royal Babies' Hospital, Woolton.—Res. M.O. At rate of £90.
Manchester, Ancoats Hospital.—H.P. At rate of £100.
Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Jun. Res. M.O. At rate of £50.
Manchester, Christie Hospital and Holt Radium Institute, Withington.—Asst. Radiologist to Radium Inst. £500.
Manchester Northern Hospital, Park-place.—Sen. and Jun. H.S.'s. £130 and £100 respectively.
Manchester, St. Mary's Hospitals.—Two H.S.'s, Whitworth-street West Hospital. Also Two H.S.'s, Whitworth-park Hospital. Each at rate of £50.
Manchester University.—Demonstrator in Human Physiology. £300.
Mount Vernon Hospital, Northwood.—H.S. At rate of £150.
National Hospital, Queen-square, W.C.—Asst. Pathologist. £250.
Nottingham City.—Asst. M.O.H. £500.
Nottingham General Hospital—H.S. At rate of £150.
Oswestry, Shropshire Orthopædic Hospital, &c.—Two H.S.'s. Each at rate of £200.
Paddington Green Children's Hospital, W.—H.P. and H.S. Each at rate of £150.
Plymouth, South Devon and East Cornwall Hospital.—Res. Anæsthetist and H.S. to Spec. Depts. At rate of £120.
Prince of Wales's General Hospital, N.—Hon. Physician to the Skin Dept.
Putney Hospital, The Lower Common, S.W.—Res. M.O. At rate of £150.
Queen Mary's Hospital for the East End, E.—Cas. O. £150.
Queen's Hospital for Children, Hackney-road, E.—Res. M.O. At rate of £200. Also H.S. and Cas. O. Each at rate of £100.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Surgeon for Out-patients.
St. Albans and Mid-Herts Hospital and Dispensary.—Hon. Physician and Hon. Anæsthetist.
St. Giles's Hospital, Brunswick-square, Camberwell, S.E.—Clin. Asst. At rate of £100.
St. John's Hospital, Lewisham, S.E.—Res. H.P., H.S., and Cas. O. Each £100.
Salisbury General Infirmary.—H.P. At rate of £150.
Sheffield, Children's Hospital.—H.S. At rate of £100.
Sheffield Radium Centre, Royal Infirmary.—Asst. M.O. £300.
Sheffield Royal Hospital.—Ophth. H.S. £120.
Shrewsbury, Royal Salop Infirmary.—Res. H.P. At rate of £160.
Southampton Children's Hospital and Dispensary for Women.—Res. M.O. At rate of £150.
Southampton, Royal South Hants and Southampton Hospital.—H.P. and H.S. to Ear, Nose and Throat Dept. Each £150.
Southend-on-Sea General Hospital.—Res. Obstet. and Gynæcological Officer. At rate of £125.
South London Hospital for Women, Clapham Common, S.W.—H.S. At rate of £100.
South Shields, Ingham Infirmary.—Sen. and Jun. H.S.'s. At rate of £200 and £150 respectively.
Stamford, Rutland, and General Infirmary.—H.S. At rate of £200.
Stockport Infirmary.—H.P. £150.
Truro, Royal Cornwall Infirmary.—H.S. £170.
University College Hospital, Gower-street, W.C.—Ophth. Reg. £50.
University of London, University College, W.C.—Lecturer in Dept. of Physiology and Biochemistry. £350.
Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.
West End Hospital for Nervous Diseases, Welbeck-street, W.—Jun. H.P. At rate of £100.
West London Hospital, Hammersmith-road, W.—Hon. Med. Reg. to Children's Dept. Also Res. Anæsthetist. At rate of £100.
Wigan Royal Infirmary.—H.S. At rate of £150.
Wolverhampton and Midland Counties Eye Infirmary.—H.S £150.
Wolverhampton Royal Hospital.—H.S. for Ear, Nose, and Throat Dept. At rate of £100.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons at Colyton (Devon), Highworth (Wilts), and South Cave (York East Riding).

NOTES, COMMENTS, AND ABSTRACTS

WARDENS OF HEALTH

"CAN you account him wise or discreet that would willingly have his health and yet will do nothing that should procure or continue it?" Dr. A. Salusbury MacNalty, who lately quoted [1] this rhetorical question put by Robert Burton in the seventeenth century, thinks that people are now just beginning to learn that they must pay the price of health in temperance, self-control, regular habits, and hygiene of body and mind. The slow building-up of our public health system has been responsible for the development of a public conscience towards the preservation of health; and increasing longevity and decrease in national mortality are measures of success.

Dr. MacNalty traces the evolution of the public health service from the beginnings of preventive medicine foreshadowed in early Greek and Jewish rules of hygiene, down to the work of the Ministry of Health to-day. The first Sanitary Act was passed in England in 1388, and was followed by quarantine laws, by the appointment of scavengers and sanitary watchmen, and by penalties for the concealment of infected persons. The monasteries undertook the care of the sick poor in the Middle Ages, and a serious problem was created by their dissolution in the reign of Henry VIII.; to meet it, the first Poor Law Acts were passed in Elizabeth's reign, under which poor-rates, overseers, and houses for the sick and infirm were established. Workhouses were not founded until 1722, and poor-law unions came still later. The Reform Act of 1832 and the Factory Acts of 1833 remedied some of the abuses of child workers in industry, and a new principle was introduced by the appointment of inspectors who represented neither employers nor employed. In 1842 Edwin Chadwick issued his report on the sanitary condition of the labouring population of Great Britain and brought some shocking facts to light. Water-supplies were so defective that cleanliness was impossible, and the annual loss of life from diseases induced by filth and bad ventilation was greater than the toll of lives taken in warfare. His findings were confirmed by a Royal Commission, and an epidemic of cholera came to lend point to his observations. The Public Health Act of 1848 was passed, which led to the formation of a new Government department, the General Board of Health; this had to be abolished in 1858 because it had ignored the demand of the public for self-government.

In 1871, however, a new central department was formed—the Local Government Board—which was the immediate parent of the Ministry of Health. The Public Health Act was passed in 1875, consolidating the previous Acts into a sanitary code, making the appointment of medical officers of health by local authorities compulsory, and aiming at better drainage, scavenging, and sanitation. The Board directed a long series of progressive reforms, including the improvement of water-supplies, provision of isolation hospitals, and the supervision of slaughter-houses and common lodging-houses. The school medical service was established in 1907, and in 1911 the National Health Insurance Act was passed. The minority report of the Poor Law Commission of 1905 recommended that the health services of the poor-law should be taken over by local authorities, but this suggestion was not adopted till 1929. The Ministry of Health itself was not established until the war had ended in 1918, when public feeling welcomed the thought of the preservation of life instead of its destruction. The Ministry was created as a central authority to supervise the health of the people as a whole, and its chief medical officer, Sir George Newman, is also chief medical officer of the Board of Education.

[1] Medical Work of the Ministry of Health, London Hosp. Gaz., June, 1933, p. 302.

The Ministry is kept in touch with the work of general practitioners through the regional medical officers, and it coöperates closely with local authorities; it is linked with the Service departments, the Ministry of Pensions, the Home Office, the Medical Research Council, the Ministry of Agriculture and Fisheries, and other Government departments, and the chief medical officer is nominated by the Crown as a member of the General Medical Council. The Ministry, therefore, holds the threads of the health service which forms a closer network every year. But regulations, as Dr. MacNalty points out, cannot make a healthy nation unless the force of public opinion is behind them. "It rests," he says, "with the people to participate in the work of the Ministry in order to make it effective."

NEW PREPARATIONS

TANNIC ACID OUTFIT FOR BURNS.—From C. J. Hewlett and Sons, Ltd., Charlotte-street, London, E.C., we have received a specimen of an outfit for the treatment of burns by means of a tannic acid spray. The outfit consists of a tube containing "soltabs," a soltab being a compressed tablet of the following composition: tannic acid grs. 7½, hydrarg. perchlor. gr. ¼, and acid. boric gr. 1. One of these tablets dissolved in 2 fluid ounces of water, which should be warm, produces a 2 per cent. solution of tannic acid, with 1/2000 per chloride of mercury. In the box containing the outfit there are also sent a bottle with a vulcanite spray and rubber bellows.

STABISMOL.—We have received from Boots Pure Drug Company, Nottingham, samples of a solution of an oil-soluble bismuth compound for employment in the indicated cases, notably in venereal patients intolerant or resistant to treatment by arsenic or mercury. The preparation is issued in the form of a stable sterile solution in olive oil, standardised to contain 0·1 g. bismuth metal in 1 c.cm. of the stabismol solution. Stabismol is supplied in hermetically sealed glass ampoules, each ampoule containing either 2·5 c.cm. or 1·2 c.cm., of which 2 c.cm. or 1 c.cm. will be withdrawn in the process of injection. The ampoules are also made up in boxes of 10, while the Company also issue the drug in 1 oz. bottles, hermetically sealed, 1 fluid ounce containing 28·35 c.cm. Throughout the instructions issued with the preparation the advice of the doctor is assumed as to administration, and the need for oral hygiene in bismuth therapy is emphasised

"MEDICINE IN CANADA"

THIS little book [1] is in no sense a systematic history of medicine in Canada, but it contains a sound selection of material and affords illustrative aspects of the whole subject. The greater part of the text is made up of short biographies of the pioneers of medicine in Montreal, Quebec, and Toronto, among the most detailed of these being an outline of the career of that extraordinary character, John Rolph, the hero of "Rolph's Ride." A considerable bibliography informs the reader where further information can be found concerning many of the subjects and characters dealt with.

[1] Medicine in Canada. By William B. Howell, M.D. Clio Medica Series, No. IX. Edited by E. B. Krumbhaar, M.D. New York: Paul B. Hoeber, Inc. 1933. Pp. 137. $1.50.

A VISIT TO THE BEMAX FACTORY

THE members of the council of the Metropolitan Branch of the Society of Medical Officers of Health visited the factory where Bemax is manufactured, on June 30th, at the invitation of Vitamins, Ltd. Lunch was provided for the party, which numbered over 70, including lady guests, at the Clarendon Hotel, Hammersmith, before the inspection of the factory and research laboratories, which occupy a spacious riverside frontage. The process was followed from the arrival of the wheat germ in sacks, and its crushing to appropriate size; the transport by air pressure to ovens and the sifting of the cooked product; and finally its packing in tins and cartons for home consumption and in special containers for export. During all these processes bemax is not touched by hand. The excellent ventilation of the factory and the hygienic conditions under which the work is done was the subject of appreciative comment.

The rats on which potency tests are made are well housed in a separate building. After the tour Dr. A. Z. Baker, the head of the research department, briefly described the material exhibited in the laboratories. She emphasised the importance of proper standardisation of vitamin-containing substances and drew attention to experimental methods in use, pointing out the value of the international standards recently adopted. Preliminary tests, now being made, suggested that the value for bemax would be somewhere in the neighbourhood of 400 international units of vitamin B_1 per ounce. She referred to the similarities between pathological conditions occurring in a large colony of partially B-deficient animals and in the human population, and concluded that much so-called "general debility" might be traceable to the consumption of a mixed diet containing only limited amounts of vitamin B. Dr. Baker compared statistics respecting the causes of death of infants under 1 year with figures obtained from a breeding colony of rats, and found that they supported her plea for the supplying of additional vitamin B during pregnancy and lactation. Prof. J. C. Drummond then spoke. He drew attention to the increased incidence of gastro-intestinal diseases in H.M. prisons since the middle of last century, when modern milling was introduced, and regarded this as being closely correlated with the removal of the vitamin-containing germ from white flour.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

HARVEIAN SOCIETY OF LONDON.

SATURDAY, July 15th.—3.15 P.M. (at Down House, Downe, Kent), Sir Buckston Browne: Charles Darwin.

SOCIETY FOR THE STUDY OF INEBRIETY.

TUESDAY, July 11th.—4 P.M. (at 11, Chandos-street, Cavendish-square, W.), Dr. J. D. Rolleston: Alcoholism in Mediæval England.

PADDINGTON MEDICAL SOCIETY.

TUESDAY, July 11th.—9 P.M. (at the Great Western Royal Hotel, Paddington), Sir James Purves-Stewart: Medical Impressions of Soviet Russia.

INTERNATIONAL SOCIETY OF UROLOGY.

MONDAY, July 10th, to SATURDAY.—Congress in London.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.

THURSDAY, July 13th.—7.15 for 7.30 P.M. (at the Florence Restaurant, London, W.), Annual General Meeting. (Preceded by Dinner.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

MONDAY, July 10th, to SATURDAY, July 15th.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Broad-street, W.C. Course in Ophthalmology. Mon., Wed., and Thurs. Afternoons and evenings.—HOSPITAL FOR CONSUMPTION, Brompton, S.W. Course in Practical Pathology dealing with Laboratory Methods and the Interpretation of Results. Mon. and Thurs., 11.30 A.M. to 1 P.M.—ALL SAINTS' HOSPITAL, Austral-street, West-square, S.E. Course in Urology. Afternoons and some evenings.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Demonstration of X Ray Films by Dr. Peter Kerley, on Thurs. at 4 P.M. to 6 P.M.—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars-road, S.E. Course in Dermatology. Every afternoon.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith-road, W.

MONDAY, July 10th.—10 A.M., Medical and Surgical Wards. Skin Clinic. 2 P.M., Gynæcological and Eye Clinics. Surgical Wards.

TUESDAY.—10 A.M., Medical Wards. 11 A.M., Surgical Demonstration. 2 P.M., Throat, Nose, and Ear Clinic. 4.15 P.M., Mr. Green-Armytage: Common Diseases During Pregnancy.

WEDNESDAY.—10 A.M., Medical and Children's Wards. Children's Clinic. 2 P.M., Eye Clinic. 3.45 P.M., Venereal Disease Demonstration.

THURSDAY.—10 A.M., Neurological and Gynæcological Clinics. 11 A.M., Fracture Demonstration. 2 P.M., Eye and Genito-urinary Clinics.

FRIDAY.—10 A.M., Skin Clinic. 12 noon, lecture on Treatment. 2 P.M., Throat, Nose, and Ear Clinic.

SATURDAY.—10 A.M., Medical and Surgical Wards, Children's Clinic.

DAILY.—2 P.M., Operations, Medical and Surgical Clinics. The Demonstrations at 4.15 P.M. are open to all medical practitioners without fee.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.

WEDNESDAY, July 12th.—4 P.M., Mr. L. Phillips: Demonstration of Antenatal Cases.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

THURSDAY, July 13th, to SATURDAY.—Conference at Cardiff.

Appointments

FORMBY, MYLES L., M.B., B.S. Adelaide, F.R.C.S. Eng., has been appointed Assistant Surgeon, University College Hospital, in the Ear, Nose, and Throat Department (Royal Ear Hospital).

MACLEOD, A. J., M.B., Ch.B. Glasg., Medical Referee under the Workmen's Compensation Act, for Lochmaddy District (Inverness, Elgin, and Nairn).

City of London Maternity Hospital: MANCLARK, R. A., L.R.C.P. Lond., M.R.C.S., Resident Medical Officer; KNOWLTON, R. W., L.R.C.P. Lond., M.R.C.S., Assistant Resident Medical Officer

Births, Marriages, and Deaths

BIRTHS

MURRAY.—On June 21st, at Blighmont House, near Southampton, the wife of Major Douglas H. Murray, M.D., R.A.M.C., of a daughter.

SMITH.—On June 30th, at a nursing-home, Cardiff, the wife of Dr. A. H. D. Smith, M.C., Greenfield, Llanelly, Carmarthenshire, of a daughter.

MARRIAGES

ANDERSON—GIBBINS.—On June 28th, at St. Mary's Church, Temple Guiting, Thomas Macmillan Anderson, M.D., F.R.C.P.E., to Kathleen Elsa Gibbins, of Birmingham.

CUDDIGAN—REDFERN.—On June 28th, at St. Mary's Church, Derby, James Cuddigan, M.B., eldest son of the late Michael Cuddigan and Mrs. Cuddigan, of Midleton, Co. Cork, to Janet Mildred Wheatcroft, elder daughter of Mr. and Mrs. W. W. Redfern, of Ashleigh, Ripley, Derby.

SMITHERS—ANGEL.—On June 30th, at St. James's Church, Tunbridge Wells, David Waldron Smithers, M.R.C.S., L.R.C.P., to Marjorie, only daughter of Mr. and Mrs. H. Reeve Angel, of Ferncliffe, Tunbridge Wells.

DEATHS

ANDERSON.—On June 29th, at Loudoun-road, N.W., John Ford Anderson, M.D., M.R.C.P., aged 93.

DICKINSON.—On June 29th, John Alfred Ernst Dickinson, C.B., I.S.O., of Ritherdon-road, S.W., aged 74.

GREER.—On July 1st, at The Red House, Bedfont, Middlesex, William Wells Greer, M.C., M.D., F.R.C.S.E.

OWEN.—On July 1st, at Highfield, Rushden, Northants, Charles Richard Owen, M.R.C.S., L.R.C.P., aged 85.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

ADDRESSES AND ORIGINAL ARTICLES

THE INFLUENCE OF THE ENDOCRINE SYSTEM IN BLOOD DISORDERS

By Douglas Hubble, M.B. Lond.

ASSISTANT PHYSICIAN TO THE DERBYSHIRE HOSPITAL FOR SICK CHILDREN

It has long been a commonplace amongst Continental hæmatologists that the secretions of the endocrine glands have a specific effect on hæmopoiesis, and it has been postulated by many observers, and by Naegeli in particular, that several of the obscure blood diseases are caused by a primary disorder of some part of the endocrine system. It is not a view which has gained many adherents, either in this country or in America, and it must be admitted that up to a few years ago there was little good evidence for such a hypothesis. The position is now changed, and the whole subject demands re-examination in the light of newly established facts. This fresh evidence has been produced by many clinicians and physiologists, mainly in America, and no previous attempts have apparently been made to correlate their observations.

It is intended to outline in the first part of this paper the effect of the hormones of the thyroid, the adrenals, and the pituitary on hæmopoiesis. There is a large literature concerning the possible influence of secretions from other organs, particularly the spleen and the ovaries, but the evidence is so conflicting that it is difficult to coördinate it into an intelligible review. It may, however, be regarded as established that both the spleen and the ovaries do exert a definite effect on blood formation. No attempt is made to distinguish between the action of the members of the endocrine system and the adjacent parts of the nervous system. The possibility is not denied that in any apparently pure endocrine effect the nervous system may play a controlling or subordinate part, but an endeavour, for example, to disentangle the pituitary from the diencephalon, or the thyroid from the sympathetic system, would obviously be futile in the present investigation.

In the second part the attempt is made to trace, by fact, analogy, and theory, evidence of endocrine disorder in those hyperplasias and hypoplasias of the blood whose ætiology is still obscure.

There follows now a résumé of the experimental and clinical evidence concerning the influence of the thyroid, the adrenals, and the pituitary on hæmopoiesis.

The Thyroid Gland

EXPERIMENTAL EVIDENCE

Thyroidectomy in animals.—The removal of the thyroid gland in experimental animals has been shown by many observers to result in a decrease in the number of circulating red cells, and in a decline in the percentage of hæmoglobin. These experiments have been recently repeated with great care by Kunde and others,[1] and these results confirmed. These observers showed, moreover, that the resulting anæmia was characterised by an increase in the diameter of the red cells and a high colour-index. They excluded the possibility that the anæmia was apparent rather than real—i.e., due to the dilution of the plasma—by studies of the blood volume. Scherman [2] reports that in animals with an experimentally produced anæmia blood regeneration is retarded by thyroidectomy, and Askanazy [3] likewise states that animals in whom thyroidectomy has been performed do not show the normal polycythæmic reaction at pressures lower than atmospheric. The reported effects of thyroidectomy on the leucocytes are not so unanimous, but most observers report a depression in the lymphocytic elements, while both increases and decreases in the granular cells have been recorded.

Thyroid feeding in animals.—The reports of experimental thyroid feeding on the blood count have been discordant, but Kunde and others, in experiments with a large series of rabbits, both normal and "cretin," have shown the reason for this. The first effect they noted was an increase both in the red cell count and the percentage hæmoglobin, but if treatment was prolonged a secondary anæmia showed itself characterised by a lowered colour-index and diminution in the size of individual erythrocytes (vide infra a similar effect has been noted clinically). In the "cretins," but not in the normal animals, a reticulocytosis ranging from 4 to 10 per cent. followed thyroid administration.

Jedlowski,[4] in very interesting experiments, treated 26 pregnant guinea-pigs by thyroid extract and studied the blood picture of the offspring. He found an average erythrocyte count of 6,150,000 as compared with 4,500,000 in control animals produced by non-thyroidised mothers. This effect lasted only 15 to 20 days after birth, when the blood count fell to normal limits.

Varied accounts are given of the effect of thyroid feeding on the total leucocyte count and the polymorphonuclear cells, but most observers record an increase in the lymphocytes, monocytes, and basophil cells. Lim and others,[5] in experiments performed ten years ago, studied the effect on the bone-marrow instead of on the circulating elements, and found after thyroid feeding a marked increase in granulocytes and small mononuclears in the bone-marrow.

CLINICAL EVIDENCE

Blood picture in myxœdema.—It has long been recognised that myxœdema is frequently accompanied by a secondary anæmia, leucopenia, and a relative or absolute lymphocytosis. Lerman and Means [6] state that of 52 cases of myxœdema studied by them, 60 per cent. had red counts below 4,000,000 per c.mm. In most cases the blood picture is one of secondary anæmia, but in some it is of the hyperchromic, megaloblastic type. Means, Lerman, and Castle [7] have reported five cases with a blood picture of pernicious anæmia, and Mackenzie [8] has reported three. In this connexion it should be noted that Lerman and Means have recently demonstrated that 9 out of 17 patients with myxœdema showed complete achlorhydria, and they found that there is a direct correlation between the presence of achlorhydria and the degree of anæmia.[9] In some cases the blood picture is restored to normal by thyroid administration alone, but in others iron or liver is needed for complete restoration. Witts,[10] in this country, has called attention to these cases of hypothyroidism with a hyperchromic, megaloblastic blood picture.

Blood picture after thyroidectomy.—Jackson,[11] after an examination of the blood in 600 patients suffering from goitre with varying degrees of hyperthyroidism, reports after thyroidectomy a consistent increase in the polymorphonuclear count and a decrease in the lymphocytes, with no characteristic alteration in the red cell count. Hertz and Lerman [12]

state that the immediate effect of operation in Graves's disease is to increase the total number of leucocytes, owing chiefly to the increase in polymorphonuclears.

Thyroid administration.—The effect of thyroid administration has been most carefully worked out by Hoskins and others in America. Hoskins and Sleeper [13] administered desiccated thyroid substance for long periods to 15 schizophrenic male human subjects. There was a marked increase in the erythrocytes in 13 of the cases, the average red cell count after treatment was increased from 4,635,000 per c.mm. to 5,150,000. There was also a definite increase in the average lymphocyte count after treatment. Later, Hoskins and Jellinek [14] found that the average red cell counts in a group of 82 male schizophrenic patients were significantly increased, and the total leucocyte counts slightly decreased following thyroid medication. In the case of the leucocytes this effect was predominantly upon the polymorphonuclear cells, whereas the lymphocytes were relatively increased. It was found, too, that there was (as in Kunde's animal experiments quoted above) a medium optimal dosage—i.e., in 52 patients originally anæmic the red cells at first increased and then decreased as the dosage was raised.

Blood picture in hyperthyroidism.—Plummer,[15] in an investigation of 578 patients showing clinical hyperthyroidism, found a consistent decrease in the percentage of polymorphonuclear neutrophils and an absolute mononucleosis. Hertz and Lerman [12] confirm these findings, and they report as the most marked characteristic of the blood in patients with exophthalmic goitre a relative and absolute monocytosis. The percentage of leucocytes is increased above normal in most cases. McCullagh and Dunlap [16] report a relative lymphocytosis in a majority of cases of hyperthyroidism, and state that this lymphocytosis is dependent on two factors: (*a*) an absolute lymphocyte rise, and (*b*) the presence of leucopenia. Jackson [11] concludes from his observation on 600 patients that the blood picture in hyperthyroid states is not significantly different from normal. Mackenzie,[8] in a review of the literature on this point, concluded that there is frequently a lymphocytosis but no characteristic erythrocytosis. In this connexion it must be remembered that the thyroid hormone has been shown, both experimentally and clinically, first to stimulate and later to depress red cell formation (vide supra).

In summarising the position with regard to the effect of the thyroid hormone on hæmopoiesis, it may be accepted that it has an initial effect of stimulating red blood-cell formation, that it stimulates the output of lymphocytes, and that it has a tendency to depress the formation of the granular leucocytes.

The Suprarenal Cortex

It has long been known that the injection of adrenaline in normal persons produces a lymphocytosis in the circulating blood which passes over to a neutrophilia and thrombocytosis. However, this is probably not due to any effect on hæmopoiesis but to other factors, such as the accelerated contractions of the spleen, which temporarily increase the output of the stored leucocytes. Yet it must be remembered that in Gibson's well-known case [17 18] of aplastic anæmia in a child the bone-marrow seemed to be definitely stimulated by the daily injection of three minims of 1 in 1000 adrenaline maintained for long periods. In spite of this notable result it is to the adrenal cortex rather than to the medulla that investigations must be directed to obtain evidence of a stimulating effect on hæmopoiesis.

EXPERIMENTAL

Until recently there was little laboratory evidence as to the effect of the adrenal cortex on hæmopoiesis, but now Britton and his co-workers in the University of Virginia, in their extensive physiological researches into the hormones of the adrenal cortex, have reported fully concerning it.[19] They found that experimental adrenal insufficiency in animals produced definite changes in the blood. It was necessary to take into account the marked dehydration (as in the thyroid experiments quoted above) for adrenal insufficiency in animals and man (Addison's disease) produces a decrease in blood volume and increased cellular concentration, so that cell counts have to be checked by blood volume observations. They deduce therefore that the increase in the erythrocytes from 50 to 100 per cent. is probably due to fluid loss from the blood. The important change is in the leucocyte count. The total leucocytes are decreased by 50 per cent., this reduction is in the neutrophils alone, and the lymphocytes show a percentage increase. The neutrophils are sometimes reduced practically to disappearing point. The administration of cortico-adrenal extract to animals suffering from adrenal insufficiency and showing the blood changes described above resulted in complete restoration of normal cell values, and this restoration coincided with the general improvement in the animals. They suggest that this granulopenia of adrenal insufficiency is related to the clinical condition of agranulocytosis. This is discussed below. Moehlig and Bates [20] report a polycythæmia after extirpation of the adrenals in dogs which they attribute to a compensatory hyperplasia of the basophil cells of the pituitary which they found post mortem in several of their animals. They make no distinction, however, between a *true* polycythæmia in which there is excessive cell production, and an *apparent* polycythæmia which is due to increased concentration of the blood. Britton and Corey have shown that the erythræmia after adrenalectomy is apparent and not real, and therefore no conclusions can be drawn from such experiments as to the effect of the adrenal cortex on blood formation unless they are checked by blood volume estimations.

CLINICAL

The blood picture in Addison's disease.—It may be said at once that there is confirmation of the experimental work outlined above in regard to the leucocytes. Rowntree and Snell,[21] in their investigation of 108 cases of Addison's disease, point to a polymorphonucleopenia in a majority of cases, often to less than 50 per cent. of the total leucocyte count. With regard to the red cells, there is no unanimity of opinion. Anæmia was thought by Addison to be one of the cardinal symptoms of the disease, but the general opinion at the moment is that anæmia is an uncommon symptom. Rowntree and Snell in their 108 cases found only three with a red count of less than 3,500,000 per c.mm., and but seven with less than 60 per cent. hæmoglobin. Simpson [22] records one grossly anæmic patient in a series of six cases. Hartman and others,[23] however, in a series of seven cases, found four to be definitely anæmic, and Rowe [24] states that "amongst the earliest change in the blood in Addison's disease is a depression in both the hæmoglobin and the erythrocyte count, but with a greater depression of the latter so that the colour-index rises towards 1,

and may even exceed it." Moehlig and Bates [20] make reference to the reports of polycythæmia in Addison's disease which are occasionally found in the literature. Here again the polycythæmia is certainly apparent and not real, for, according to Rowntree and Snell,[21] the blood volume is diminished in Addison's disease during the crises and terminal phases.

Tumours and hyperplasia of the adrenal cortex.—It is extraordinary how frequently reports of adrenal tumours state that the patient is plethoric, or has a high colour, and how infrequently there is any record of a blood count. Glynn,[25 26] Gordon Holmes,[27] Langdon Brown,[28] Broster and Gardiner-Hill,[29] and Cecil [30] report cases without blood counts. Dingwall Fordyce [31] reports two cases (both children), in one there was a secondary anæmia, and the other was said to be of high colour. Fischer [32] however reports a malignant tumour of the cortex of the suprarenal in a woman who showed well-marked virilism, and here there was a notable polycythæmia—10,500,000 per c.mm. G. H. Turney, quoted by Parkes Weber,[33] reports one of this type in which erythrocytes had on occasion been as high as 8,000,000 per c.mm., but prior to her death they reached a normal level. (This case may possibly have been an example of basophil adenoma of the pituitary.) Zucker [34] reports a carcinoma of the left suprarenal cortex in a woman who showed well-marked polycythæmia. Moehlig and Bates [20] suggest that the polycythæmia which occurs in tumours of the adrenal cortex is due to a concurrent basophilic hyperplasia of the pituitary. This is possibly true, but it cannot be regarded as proved. No significant increases in the granulocyte counts have apparently been reported in these cases.

Effect of cortico-adrenal therapy.—There are as yet no reports in the recent literature concerning the clinical effect of the new cortical extracts on blood formation, but four years ago Huth [35] published some remarkable results on the effect of administering dried whole adrenal cortex by mouth to a large number of patients. In two patients with normal blood counts he increased the erythrocyte counts from 4,850,000 and 4,880,000 to 5,680,000 and 5,710,000 respectively in less than a fortnight by doses of adrenal cortex, 3 to 5 g. daily. As examples of his results in anæmic patients may be instanced the following:—

(1) A man, aged 31, with acute rheumatism, in whom the erythrocyte count was raised in a week from 2,600,000 per c.mm. to 4,680,000 per c.mm. (2) A woman, aged 48, with thrombophlebitis, in whom the erythrocyte count was raised from 3,266,000 per c.mm. to 4,860,000 per c.mm. in a week. (3) A man, aged 41, suffering from Addison's disease, in whom the erythrocyte count was raised from 3,988,000 per c.mm. to 4,750,000 per c.mm. in a week. (4) A man, aged 60, dying of carcinoma of the stomach, in whom the erythrocyte count was raised in three weeks from 2,850,000 to 4,360,000 per c.mm. but one week before his death.

These remarkable results demand repetition and confirmation * now that potent cortical extracts are available, and until reports are published on the effect of these extracts on the red cells in the anæmias and in healthy persons, the influence of the adrenal cortex in red cell formation must remain undecided.

In summary, it may be regarded as certain that the adrenal cortex stimulates the formation of neutrophils, and as possible that it has some stimulating effect on erythropoiesis.

* This has been recently confirmed by R. G. Hoskins and L. Freeman (Endocrinology, 1933, xviii., 29). They treated ten schizophrenic patients with potent glycerin extract of suprarenal cortex by mouth. There was an average increase in the red cell counts of about 300,000 per c.mm.

The Pituitary Gland

EXPERIMENTAL

There is little experimental work which concerns the pituitary gland and hæmopoiesis. Houssay and others [36] found that in a series of rabbits in whom the pituitary had been removed, the average hæmoglobin content was 11·6 g. per 100 c.cm., whereas a normal control series had an average content of 13·6 g. It has been established that the pituitary in guinea-pigs, in embryonic life and during pregnancy, has a hæmopoietic function.[37 38] Schulhof and Matthies [39] found that polycythæmia of long duration was produced by an irritative lesion of the proximal part of the vegetative centres of the brain in rabbits. They deduced from this that the brain plays a part in the regulation of the numbers of the circulating red cells.

CLINICAL

There are many references in the Continental literature to polycythæmia associated with various cerebral conditions. These conditions have been reviewed recently by Moehlig and Bates,[20] so that it is unnecessary to refer more than briefly to them here. Polycythæmia has been reported in epidemic encephalitis, in concussion, in association with narcolepsy (a condition attributed to lesions of the pituitary and diencephalic area); all these conditions having a common origin, apparently, in the neighbourhood of the third ventricle and the pituitary.

Pituitary hyperplasias.—Eosinophil hyperplasias of the anterior lobe of the pituitary giving rise to the clinical syndrome of acromegaly are frequently accompanied by an erythræmia. As an example, Neuberger [40] reports a case of acromegaly in a young woman with red cells 6,400,000 per c.mm. Eight months later enlargement of the sella turcica was demonstrated by X rays, but the red cell count had returned to normal. This particular example is chosen because it illustrates an endocrine effect on blood formation which was referred to above in the discussion on the thyroid gland, and is displayed again (vide infra) in a case of pituitary basophilism. The initial stimulation of hæmopoiesis with subsequent return to normal or to depression must be considered as characteristic of the effect of endocrine hyperplasias. Incidentally it explains why alterations in the blood are not invariably observed in these hyperplasias.

Polycythæmia is a cardinal sign of the new syndrome recently described by Harvey Cushing [41] and called by him pituitary basophilism. The extraordinary complexity of this syndrome is dependent on an adenoma of the basophil cells of the pituitary which results, as Cushing expected in view of the work of Evans and Simpson,[42] in a stimulation of the ovary, the thyroid, and the adrenal cortex. Cushing regards the tendency to erythræmia as characteristic, while the accompanying leucocytosis, which is both a granulocytosis and a lymphocytosis, is an occasional sign. It is perhaps not too speculative, in view of what has been said above, to regard the erythræmia as basophilic in origin, and the leucocytosis as due to stimulation of the adrenal cortex and the thyroid. An example of this condition, which was described in this country before the clinical syndrome had been recognised, is quoted here because it shows again the characteristic endocrine effect on blood formation referred to above—namely, initial stimulation and later depression. Langdon Brown [28] reports a case of virilism occurring in a woman who was found post mortem to have a basophil adenoma of the anterior lobe of the pituitary. Her blood showed:

red cells 7,000,000 per c.mm., Hb. 120 per cent., and leucocytes 14,000. Two years later, when she was under the care of Parkes Weber, the polycythæmia had disappeared.

Anterior pituitary hypoplasia.—This is known clinically as Simmonds's disease, or cachexia hypophyseopriva, and was first described by him in 1914. Caulder,[43] in a recent review of the condition, makes no mention of anæmia as part of the syndrome, but Silver[44] says: "Anæmia is a constant finding, and the hæmoglobin averages 50 per cent. The leucocytes are often reduced in number, and an eosinophilia is an interesting and common finding." Graham Lescher,[45] in a case of Simmonds's disease in a girl with a profound and intractable cachexia, reports a steadily progressive anæmia which has not responded to any treatment. A characteristic blood count from this patient is: red cells 1,780,000 per c.mm., Hb. 35 per cent., white cells 8000 (neutrophils 64 per cent., lymphocytes 23 per cent., monocytes 5 per cent., eosinophils 2 per cent., and neutrophil myelocytes 6 per cent.).

In Fröhlich's syndrome, a chromophobe adenoma, anæmia is sometimes reported, and the assumption is that it depends on a compression of the granular cells of the anterior pituitary. Mackenzie [8] reports Fröhlich's syndrome in a boy whose red cells numbered 3,350,000 per c.mm. and Hb. 60 per cent.

DISCUSSION OF THE FOREGOING

To summarise the clinical and experimental evidence concerning the influence of the endocrine system on hæmopoiesis briefly: the thyroid gland stimulates the production of red cells and lymphocytes and probably depresses the output of granulocytes; the adrenal cortex stimulates the production of granulocytes and possibly the red cells; the basophil cells of the anterior lobe of the pituitary stimulate all types of cell, giving rise to a clinical picture of polycythæmia. It is possible that part of this effect is produced indirectly by the basophil cells through the thyroid and adrenal cortex. It may be objected that if the endocrine system is to be accepted as a chief factor in the endogenous control of blood formation, there should be more evidence of changes in the blood picture in endocrine disorders. There are two answers to this objection. There is not only a delicate and balancing antagonism between the various portions of the endocrine system, but there is apparently some overlapping in their function, so that if one fails another attempts to make good the loss, and if one runs amok, another is ready to restrain. Moreover, there is much available evidence which has not yet been collected—for example, there is an extraordinary scarcity of reports of blood counts in tumours and hyperplasias of the adrenal cortex, conditions which are certainly accompanied by alterations in the blood count.

The Endocrine System and Blood Diseases

That the nervous system plays a part in this endogenous control seems likely, but no attempt is made to decide which is the dominating partner. Some clinicians, as for example, Castex,[46] have attributed the controlling rôle in certain blood disorders to the nervous system, though it appears probable that if there are endogenous controls which are more or less specific for the individual elements in the blood, these immediate controls will prove to be the individual members of the endocrine system, whatever may prove to be the influence of the nervous system. It is interesting to consider now whether evidence of endocrine disorders can be traced in diseases of the blood whose pathogenesis has as yet escaped elucidation. The blood disorders to be discussed are those in which there is over-production or under-production of one or more of the cellular constituents of the blood. They are, therefore, the leukæmias, lymphatic, myelogenous, and monocytic, with polycythæmia vera; aplastic anæmia and its daughter disorders—agranulocytic angina and purpura hæmorrhagica. These are rare blood disorders (their total incidence is not so great as that of pernicious anæmia) but they have an importance out of proportion to their frequency, for if at one end of the scale they represent innocent and temporary increases in the rate of cell production, at the other end they take on the characters of malignancy. The pathogenesis of the leukæmias will not be determined without teaching something of the factors involved in the production of sarcomata. It is not suggested that our present knowledge of the underlying factors is complete, but it is maintained that the following hypotheses are sufficiently reasonable to demand further investigation in the laboratory, in the post-mortem room, and at the bedside.

Blood Disorders which Show Cell Hyperplasia

LYMPHATIC LEUKÆMIA

It has long been known that there is a marked increase in the basal metabolic rate in chronic lymphatic leukæmia. Du Bois,[47] reviewing his own work and that of others, records, in nearly every case of lymphatic leukæmia investigated, basal metabolic rates varying from plus 20 per cent. to plus 90 per cent., these rates being as high as those obtained in severe Graves's disease. Early investigators suggested that this increase was due to the increased oxygen consumption of immature cells, but it has since been shown that there is no constant relationship between the total white blood-cell count, the state of maturity of the leucocytes, and the height of the basal metabolic rate.

Minot and Means [48] stressed the similarity between Graves's disease and lymphatic leukæmia, and advanced the comparison by demonstrating that there is a markedly high pulse-rate in lymphatic leukæmia and, a fact of great interest, that this increase in basal pulse-rate bears almost exactly the same mathematical relationship to the increase in the basal metabolic rate as obtains in Graves's disease. Such observations as these have compelled American clinicians, and in particular Friedgood,[49] to consider anew the clinical and pathological manifestations of these apparently dissimilar diseases.

Of ten patients suffering from chronic lymphatic leukæmia investigated by Friedgood,[49 50] eight complained of unusual irritability and nervousness, six loss of weight, five of increased sweating, four of precordial palpitation, and two of diarrhœa. All had a raised basal metabolic rate varying from plus 26 per cent. to plus 66 per cent.; five had definite tachycardia; no less than six patients had one or more of the ocular signs characteristic of exophthalmic goitre—namely, five had unilateral prominence of the right eye, four had bilateral exophthalmos, two had von Graefe's sign, two had Kocher's sign, and two Dalrymple's sign. Friedgood then recalled (what the pathologists had not forgotten) that there is often evidence of marked lymphoid hyperplasia in exophthalmic goitre. It has been shown above that an examination of the blood in Graves's disease commonly reveals a lymphocytosis, and MacCallum in his text-book of pathology states: "In some cases this increase in the bulk of the lymphoid tissue occurs throughout the body, even the solitary

nodules in the intestine projecting as grey prominences. The thymus is found to be greatly enlarged. This has been constant in the autopsies which I have seen, and in some cases it has presented itself as an organ almost the size of one's hand." [51] It is said that splenomegaly can be detected clinically by palpation and percussion in about 20 per cent. of cases of exophthalmic goitre.[52]

Friedgood, in order to carry this comparison further, applied the therapeutic test of iodine in ten cases of chronic lymphatic leukæmia. In summarising this experience he writes: "The laws which apparently govern the response of exophthalmic goitre to iodine seem to apply with remarkable similarity to chronic lymphatic leukæmia. In a certain percentage of patients with chronic lymphatic leukæmia, iodine will induce a symptomatic remission and a temporary decrease in basal metabolic and pulse-rates, in addition to a transient reduction in the size of the cervical lymph nodes, and in the height of the total leucocyte count." The parallel appears to be complete and he concludes: "The physical signs and clinical symptoms of chronic lymphatic leukæmia are strikingly similar in *quality* to those noted in exophthalmic goitre, and differ only in a *quantitative* manner."

The fundamental similarity and essential difference between the two disorders is best displayed by distinguishing two aspects of each disease, the one, stimulation of the sympathetic nervous system, and the other, hyperplasia of the lymphatic system. In Graves's disease the "sympathicotonic" effect is dominant, and in chronic lymphatic leukæmia the "lymphoplastic" effect is supreme; but in each disease the subordinate lymphoplastic or sympathicotonic effect is present, sometimes obvious, but more often masked.

Friedgood is more concerned with the light these new facts throw on the pathogenesis of exophthalmic goitre, and he concludes for various reasons that the iodine effect is specific for the sympathetic nervous system, and that the sympathetic plays the major rôle, and the thyroid gland the minor, in the pathogenesis of these two diseases. This is not the place to controvert these conclusions, but that iodine exerts its influence in exophthalmic goitre directly through the thyroid gland would appear to have been sufficiently established by numerous observers, and the only alternative to Friedgood's conclusion is that the effect in lymphatic leukæmia is also produced through the thyroid.

The pathogenesis of exophthalmic goitre and the interaction of the thyroid secretion and the sympathetic nervous system are problems which have not yet found a final solution. Langdon Brown [53] writes: "In Graves's disease we have an example of the vicious circle: the sympathetic stimulating the thyroid, and the thyroid increasing the sympathetic response." However this may be, if a parallel pathogenesis has to be found for two diseases at once so alike and so dissimilar as exophthalmic goitre and chronic lymphatic leukæmia it is more profitable, in the present state of knowledge, to incriminate the thyroid gland rather than the sympathetic system. In fact, the obvious difficulties in providing a common pathogenesis are solved if it is postulated that the thyroid gland secretes two hormones: the first, which is "sympathicotonic," dominating the clinical picture in Graves's disease; and the second, "lymphoplastic," producing the generalised hyperplasia of the lymphatic system in lymphatic leukæmia. Recent research is revealing the extraordinary multiplicity of the hormones secreted by the other endocrine glands, so that it seems unlikely that the thyroid hormone will retain for long its present simplicity.

In summary, it is offered as a reasonable working hypothesis that the thyroid gland is disordered in chronic lymphatic leukæmia. This is an assumption which, notably by Friedgood's research, has been brought to the edge of certainty.

MYELOGENOUS LEUKÆMIA

If the thyroid factor in lymphatic leukæmia is accepted and the effect of the adrenal cortex on granulocyte production is remembered, it is natural that one should turn to myelogenous leukæmia for evidence of adrenal cortex hyperplasia. The basal metabolic rate is raised in myelogenous leukæmia, and it is recorded by Friedgood that it is not lowered by treatment with iodine; the new cortical extracts have been shown by observers to raise the basal metabolic rate. The fact that the raised metabolic rate of myelogenous leukæmia is not lowered by iodine differentiates it from lymphatic leukæmia, and, as one would expect, rules out thyroid dysfunction as an ætiological factor. Priapism, rare symptom of a rare disease, occasionally occurs in myelogenous leukæmia. The time-honoured explanation for it is a leukæmic infiltration or thrombosis of the corpora cavernosa. This explanation was never particularly impressive, and a more attractive hypothesis is that priapism results from the continual discharge into the blood of an "erector" hormone from the adrenal cortex.

There is apparently no record of the finding of cortical hyperplasia in post-mortem reports of myelogenous leukæmia, nor indeed of any systematic examination of endocrine organs.

One of the most widely supported theories of the origin of the leukæmias is that they result from infection; the most cogent argument in its favour is that there exists in fowls a leucosis which can be transmitted by inoculation from one fowl to another.† Attempts to repeat this experiment in man have been unsuccessful, but Mazetti and Robinato, quoted by Piney,[54] produced a leucocytosis, increase of mast cells, and slight myelocytosis in rabbits by injection of blood and transplantation of tissue from three cases of the disease in man. These experiments lend more support to the endocrine theory than any other. They suggest that the leukæmic blood contains some substance which is stimulating to the leucopoietic processes of normal animals.

MONOCYTIC LEUKÆMIA

This is an extremely rare type of leukæmia. Orr [55] recently recorded 19 cases in the literature and published two more. The first of his cases was a man whose complaint was originally diagnosed as myxœdema, and who on two occasions improved by treatment with thyroid extract. Both his cases showed well-marked degenerative changes in the thyroid gland at autopsy. Orr reports, "the thyroid gland was replaced by dense fibrous tissue and vessels with numerous lymphoid foci," and in the second case the thyroid gland was "small, rather tough with prominent fibrous trabeculæ and little colloid." He writes: "No similar record has been found elsewhere. The association may be of ætiological importance or may be only coincidence—a point which will be elucidated by future experience."

† A skilled avian pathologist tells me that this is certainly untrue. Attempts have been made since 1921 to repeat and confirm these inoculation experiments without any success. The disease in fowls is sometimes inherited and transmitted, and is thought by many to be due to a virus, but without complete proof.

POLYCYTHÆMIA VERA (OSLER-VAQUEZ DISEASE)

There is a raised metabolic rate in polycythæmia vera, and Friedgood, in a personal communication, reports a case in which the basal metabolic rate of plus 17 per cent. was reduced to minus 3 per cent. in a fortnight (exactly comparable to the effect in exophthalmic goitre) by Lugol's iodine. In another case he reduced the red cell count from 7,130,000 per c.mm. to 5,210,000 in twelve days by Lugol's iodine. It is difficult to escape from the conclusion that this effect is exerted through the thyroid; it seems probable from the occurrence of polycythæmia in pituitary basophilism, that the thyroid is being stimulated by excessive basophilic secretion. There is a rare variety of polycythæmia named after Giesbock (polycythæmia hypertonica) which has a close relationship to pituitary basophilism, for it carries an added triad of signs—hypertension, arterio-sclerosis, and nephritis—which Cushing believes to be a basophilic effect and not, as is usually thought, due to adrenal cortex hyperplasia.[56] It becomes a reasonable hypothesis, then, that at least some cases of polycythæmia vera are due to the excessive discharge of a hormone from the basophilic cells of the pituitary; in fact, apart from the so-called symptomatic polycythæmias, these pituitary and diencephalic conditions constitute the only known ætiological factor in polycythæmia vera. Moreover, in some published cases of polycythæmia vera it is possible to trace evidence of endocrine disorder which has remained unrecognised by those reporting the cases. For example, Horder [57] records a case of polycythæmia vera in a woman in whom there was a bilateral papillœdema with diminution of visual fields suggestive of a cerebral neoplasm; and another in a man in whom there was marked osteoporosis of several bones with a spontaneous fracture of the left tibia.

It will be observed that a very striking feature of all these blood-cell hyperplasias receives its best explanation if the endocrine and nervous systems are accepted as an ætiological factor in each—and that is the marked overlapping which is observed between any two of them, i.e., the lymphocytes are increased in myelogenous leukæmia, myelocytes are sometimes present in large numbers in polycythæmia, while megaloblasts are seen in myelogenous leukæmia even in the absence of anæmia.

BLOOD DISORDERS SHOWING BLOOD-CELL HYPOPLASIA

A group of blood disorders has been reviewed by Lescher and Hubble [58] which, it is suggested, are united by a common ætiology—i.e., deficient production of the blood elements by a hypoplastic bone-marrow. These diseases include aplastic anæmia, in which all the cellular elements are deficiently produced; agranulocytosis, in which there is defective production of granulocytes only; and idiopathic purpura hæmorrhagica, in which there is great reduction of circulating elements. As in the blood hyperplasias discussed above, many cases show an intermediate state between any two of these conditions, and they are not to be regarded as clear-cut entities. A toxic and infective origin for these disorders has been widely assumed, but, although this is undoubtedly sometimes responsible, it has been shown that this hypoplasia does not explain the "idiopathic" cases; it was further suggested that there was some missing endogenous factor which was essential for the advancement of the reticulo-endothelium to the next stage in hæmopoiesis, and the possibility was discussed that this factor might be some endocrine secretion.[58] Although this still remains a tentative hypothesis, further evidence has accumulated which tends to confirm it.

Aplastic Anæmia

Kunde and her co-workers [1] note that the bone-marrow in their thyroidectomised rabbits strongly resembled the description given by Selling [59] of the bone-marrow after benzol poisoning, and by Doan [60] of the bone-marrow in starved pigeons.

This is interesting because the bone-marrow as described by Selling and Doan showed characteristic hypoplasia and aplasia, and furnish the only examples of experimentally produced aplasia. Moreover, it was from these hypoplastic bone-marrows that Kunde produced a reticulocytosis to 10 per cent. by thyroid administration which suggests that, in cretinoid animals, thyroid extract is capable of advancing the reticulo-endothelium to the reticulocyte stage in hæmopoiesis. It is well known that cases of aplastic anæmia such as Hurst's [61] may be kept in good health by repeated transfusions every three weeks or so. It seems probable that the value of the transfusions lies in the supply of a missing factor which acts as a temporary stimulant to the patient's own bone-marrow, and not in the relatively small quantitative addition to the circulating cells.

If an attempt is to be made to include aplastic anæmia in a scheme of endocrine disorders, it will have to be regarded as the exact counterpart of polycythæmia and due to a deficient secretion of the basophil cells of the anterior pituitary.

AGRANULOCYTIC ANGINA

Reference has been made above to the experiments of investigators of the University of Virginia.[19] They refer to the possibility that the granulopenia of adrenal insufficiency is related to the clinical condition of "agranulocytosis" as observed in man, and they point out that the neutrophil leucocyte is one of the chief cellular defence mechanisms. They suggest that such a highly differentiated and relatively unstable tissue as the adrenal cortex may be disorganised oftener and more readily than suspected, and such disorganisation may be implicated in neutropenic conditions observed in man. A remarkable case described by Jaffé [62] gives support to this hypothesis. He records that a case of lymphadenoma developed agranulocytosis, and at post-mortem granulocytes were even absent from the lymphadenomatous infiltrations. The suprarenals were found to be invaded and destroyed by lymphadenomatous tissue. The most thorough examination of the endocrine system in agranulocytic angina is reported by Bacaloglu and others.[63] They state:—

> "L'insuffisance pluriglandulaire doit avoir sa part dans la genèse de ce tableau clinique. Les ovares sont scléreux, l'hyophyse, surtout le lobe postérieur, la corticale des surrenales et surtout la thyroide présentent une intense sclérose avec atrophies et dégénérescences partielles des cellules glandulaires. La thyroide présente, de plus, d'abondantes infiltrations lymphocytaires, puis des amas et des cordons cellulaires à eosinophiles, comme dans une hyperthyroidie basedowienne."

It is interesting to note that the anterior lobe of the pituitary escaped this degenerative process, and that the patient's red cell count remained within normal limits during life.

Because agranulocytosis is most common in women at or about the time of the menopause, several observers have postulated an ovarian deficiency as a prime cause; it will be noted that the ovaries took part in the pluriglandular sclerosis in the above case.

Two extraordinary cases of cyclic agranulocytosis have been described by Rutledge [64] and others, and

Doan.[65] In both of them the granulocytes fall regularly every three weeks or so to extremely low values with typical attacks of agranulocytosis. Harvey Cushing,[66] referring to other physiological examples of cyclism, such as œstrus, menstruation, hibernation, and sleep, says: "That these processes are somehow under the control of the diencephalo-pituitary apparatus seems most probable." It is difficult to account for cyclic agranulocytosis except on an endocrine or nervous hypothesis.

It will be recalled that Doan,[65] Jackson and others,[67] have shown that pentose nucleotide restores granulopoiesis to normal agranulocytic conditions. It will be interesting to see whether this substance has any affinity to a hormone from the adrenal cortex.

IDIOPATHIC PURPURA HÆMORRHAGICA

There is no evidence as to any hormone stimulating platelet production, but since the platelets are markedly reduced in lymphatic leukæmia and increased in myelogenous leukæmia, it would be expected that their production is stimulated by the cortico-adrenal hormone. It is perhaps not irrelevant to add here that the antiscorbutic factor which protects animals from scurvy and is known as ascorbic acid (it is apparently identical with vitamin C) has been prepared from the cortex of the suprarenal glands. In fact this appears to be the most potent source of the antiscorbutic factor yet investigated, being three times more potent than orange juice.[68]

Conclusion

This complete hypothesis may be put into a general scheme in this way:—

Pituitary basophilic excess	..	Polycythæmia vera.
Pituitary basophilic deficiency	..	Aplastic anæmia.
Cortico-adrenal excess	..	Myelogenous leukæmia.
Cortico-adrenal deficiency (with ovarian deficiency)	..	Agranulocytic angina.
Thyroid dysfunction	..	Lymphatic leukæmia. / Monocytic leukæmia.

There is an obvious objection to this theory of endocrine imbalance as a cause for these blood disorders, and that is the meagre evidence of other signs of endocrine disorder that these diseases display. This objection cannot be answered (although it must be admitted that in the past such evidence has been but infrequently sought), without assuming that the endocrine glands produce chemical substances which are more or less specific in their action on blood formation, and that these particular hormones may be produced in excess without coincident excess of all other hormones. For example, the adrenal cortex may stimulate the granulocytes to excess without at the same time altering the secondary sex characters. This idea, while still unproven, is not so fantastic as it would have appeared a few years ago.

Some of these ideas which support this hypothesis are still speculative, for others, the facts supply reasonable proof. Their factual basis is sufficiently impressive to demand that they receive thorough investigation. It is not difficult to suggest the lines which investigation should follow: (1) Careful blood examinations in pituitary and adrenal disorders. (2) The effect of endocrine extracts (e.g., cortico-adrenal extract) on the blood in normal persons, in anæmias, in aplastic anæmia, in agranulocytic angina, and in purpura hæmorrhagica. (3) The morbid anatomy of the endocrine system in all blood disorders referred to in the scheme. (4) The effect of X ray therapy to the thyroid gland in lymphatic leukæmia.

Summary

1. The clinical and experimental evidence relating to the effect of the thyroid, the cortex of the adrenals, and the anterior lobe of the pituitary on hæmopoiesis is reviewed.

2. It is shown that the thyroid hormone stimulates the production of red cells and lymphocytes, and depresses the output of granulocytes; the adrenal cortical hormones stimulate the production of granulocytes and possibly also of red cells; while the basophil cells of the anterior lobe of the pituitary stimulate all types of circulating cells, giving rise to a clinical picture of polycythæmia. It is possible that the anterior pituitary produces this leucopoietic result indirectly through the thyroid and the adrenal cortex.

3. It is suggested that in hyperplasias and hypoplasias of the circulating blood-cells, a primary disorder of the endocrine system is the dominant ætiological factor.

4. The clinical parallelism between exophthalmic goitre and chronic lymphatic leukæmia is displayed with particular reference to Friedgood's work on the response of the basal metabolic rate, the pulse-rate, and the cell count in lymphatic leukæmia to treatment with Lugol's iodine. It is concluded that the cause of lymphatic leukæmia is a primary dysfunction of the thyroid gland.

5. It is suggested that an excess of an adrenal cortical hormone is responsible for myelogenous leukæmia, and it is pointed out that polycythæmia is a cardinal sign of hyperplastic conditions of the anterior lobe of the pituitary.

6. Two hyperplasias of the bone-marrow are considered, agranulocytic angina and aplastic anæmia, and some further evidence is reviewed which suggests for them also an endocrine ætiology.

7. In conclusion, further lines of investigation are suggested which may be expected to test these hypotheses.

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DOES INSULIN CURE DIABETES MELLITUS?

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BEFORE attempting to reply to the question "does insulin cure diabetes mellitus?" an inquiry must be made into the meaning of the word "cure." If a patient is said to be cured only when he has returned to the condition which existed before the development of the disease, then no patient is ever cured and the word might be removed from the medical vocabulary; because every disease leaves some alteration even if it be not structural but only the presence of an antibody. For the purpose of this paper a patient is said to be cured when he has returned to normal health and been able to cease taking any drug.

This is the meaning we are accustomed to give the word; most agree that quinine is a cure for benign malaria, in spite of the fact that it does not guarantee the permanent absence of the plasmodium from the circulation even without further infection. Arsenobenzene is said to be a cure for syphilis; after injection the signs and symptoms disappear but all the spirochætes are not destroyed even in some of the cases which lose the Wassermann reaction. Again, a certain drug renders the urine free from *Bacillus coli communis* and therefore may be said to cure that infection, although it is generally recognised that relapse is common. I think that there is sufficient evidence that a preparation is called curative if it assists the patient to regain his normal health, in spite of it not preventing relapse.

The definition of diabetes mellitus for the purpose of this paper is very different from that which I have suggested when discussing methods of diagnosis; it is very much more crude—namely, glycosuria accompanied by thirst, polyuria, and loss of weight; a condition which can be diagnosed without recourse to laboratory methods. (The cases upon which this paper is based were all proved to have hyperglycæmia.)

The production of patients who have suffered from these signs and symptoms and have been treated with insulin, and now appear to enjoy normal health, would not allow a reply to the question in the affirmative, unless there were very considerable evidence that spontaneous recovery from diabetes mellitus either does not occur or is of extreme rarity.

For more than 17 years I have served diabetic beds at the London Hospital, and during that time I have not met a single case of undoubted diabetes mellitus which has made a spontaneous recovery. From the statements of my friends I believe that recovery without treatment with insulin may occur, but in all probability no more frequently than retrogression of cancer. Years ago, before the diagnosis of diabetes mellitus was based upon hyperglycæmia and all cases of glycosuria were believed to be cases of true diabetes mellitus, alleged recovery was not so very rare, because a rise of the renal threshold for sugar abolished the glycosuria, and the patient was pronounced cured. I have yet to hear of a case of progressive hyperglycæmic glycosuria recovering without the administration of insulin.

REASONS WHY INSULIN MAY FAIL

If insulin cures diabetes mellitus, why does it do so only rarely? There are at least four causes of failure known to us and probably a number of factors still to be discovered. These four causes are:—

1. Just as quinine will not cure malaria except in adequate doses, so, too, insulin will not cure diabetes mellitus except in adequate dose for the diet prescribed. A better simile exists in the treatment of subacute combined degeneration with liver: massive doses lead to amelioration, whilst the doses which suffice in Addison's anæmia prove inadequate.

2. This is more difficult to illustrate with a simile, and the one I give leaves much to be desired. Some forms of gastric ulcer may be treated successfully (cured) by the administration of a monotonous protein diet along with substances which keep the contents of the stomach from becoming very acid; this procedure would become unavailing if the patient were to take appetising food or large quantities of mustard or concentrated alcohol during the treatment, because the gastric mucosa would be stimulated to secrete acid in quantities which could not be neutralised by food and drugs. In a similar manner insulin is hampered in its action by the patient taking substances which stimulate the cells of the islands of Langerhans to secrete; the most important of these is alcohol.

3. The third factor which reduces the curative influence of insulin is toxins elaborated by viruses or micro-organisms. How these may retard recovery will be considered later.

4. A patient who has had an acute attack of diabetes mellitus is not protected from further

attacks. Just as a man who has had pneumonia is more likely than the average normal to have a further attack, so a man who has had one acute attack of diabetes is prone to suffer from a second or even a third attack. This, too, will be considered in further detail later.

ADEQUATE DOSAGE

What is an adequate dose of insulin for a certain diet? Replies to this question would be found to differ very greatly. It is now so many years ago that F. M. Allen[1] showed whilst working at the Rockefeller Institute that the pancreas is destroyed by overwork and may regenerate by resting, that many have forgotten the fact; perhaps the advice issued when insulin first became available tended to drive Allen's work from the memory because the fear of the danger of hypoglycæmia was paramount, and to escape that, the users of insulin were told that a little sugar in the urine was a good thing and acted as a safety valve. A doctrine suggested by fear rarely helps mankind.

An adequate dose of insulin must rest the pancreas. One of the ways that the pancreas is stimulated is by a high concentration of sugar in the blood. By keeping the sugar content of the blood quite low that method of stimulation is prevented.

The dose of insulin will depend upon the diet prescribed. I am strongly in favour of arranging the diet for the individual patient and not issuing a mandate that patients of certain ages and weights must all eat the same amount of carbohydrate, protein, and fat. In the majority of adults the acceptable diet is found to contain more than 150 g. of carbohydrate, the amount of protein and fat differs greatly in different people. The lower the sugar content of the blood can be kept the greater the chance of the patient making a recovery. Here, too, the idiosyncrasy of the individual has to be taken into consideration. Some are quite happy with a concentration of sugar in the blood as low as 0·05 per cent., whilst others wilt when the sugar falls to 0·075 per cent. The ideal I set myself is to arrange food and doses of insulin to keep the sugar content of the blood between 0·08 per cent. and 0·15 per cent. throughout the 24 hours. In severe cases on a diet fairly rich in carbohydrate this may necessitate three or even four injections of insulin in the 24 hours for a time; it is a great exception for more than two to be needed for longer than six months.

The number of times that food is taken cannot be limited to three or four times in the 24 hours; carbohydrate may be needed five or six times in the 24 hours. The interval between the injection of insulin and the meal must be determined by trial in each case; as a rule it should be the maximum which does not lead to the development of hypoglycæmic symptoms before the carbohydrate of the meal can be absorbed. I have known it as high as 90 minutes and as low as 5 minutes. After a meal rich in carbohydrates the sugar content of the blood will tend to rise, and if the dose of insulin sufficient to prevent this exceeding 0·15 per cent. be administered, there is considerable probability that between three and four hours after the injection the sugar in the blood will fall low enough to cause symptoms. This is prevented by the patient taking a small amount of carbohydrate in a form which is easily assimilated, about two and a half hours after the injection of insulin. The quantity must be determined by trial. Although this form of treatment sounds complicated it is accomplished by patients of comparatively low intelligence. All my patients who have recovered, throughout the treatment (except for the first three weeks) either earned their living at work or filled the more arduous task of wife, mother, and housekeeper.

If the patient be in some place where it is impossible to estimate the sugar content of the blood (a process which many of my patients who live in the wilds have acquired with ease) the treatment would be summed up by giving the maximum amount of insulin that the patient can take and arranging food to counteract hypoglycæmia. As time passes hypoglycæmic attacks become more pronounced, and since the patient is having all the food he requires a reduction in the dose of insulin is made and further reductions from time to time until none is required.

ALCOHOL

Less than a quarter of a century ago alcohol was ordered for patients suffering from diabetes mellitus when they were unable to utilise a diet which maintained their weight—ordered with the object of supplying them with a form of energy which they were able to utilise. This had a theoretical basis, but in practice it did not prove of very great value because in many cases the metabolic rate was increased and nothing was gained.

Views change slowly, and at the present day the majority of physicians permit their diabetic patients to take alcohol in moderation in the form of brandy without obscuration, or colourless whisky or gin; if they permit wines they advise the sugar content of the wine to be calculated in the carbohydrate ration. I cannot help thinking that many must have had the same experience as I, that amongst their patients those who have been total abstainers have improved more rapidly than those who have been moderate drinkers. At first I attributed this to the fact that alcohol depresses the highest centres and thus weakens self-control, and I believed that the rules were not adhered to so rigidly by the drinker as by the abstainer. Since, however, some of my patients who took alcohol were under the close and unfailing observation of their respective wives, I was forced to the conclusion that it was the alcohol itself that was detrimental, and I thought for a time that it had an effect comparable to ether or chloroform. It was T. C. Hunt's[2] observations which offered the most satisfactory explanation; he found that medicinal doses of alcohol led to a fall of the sugar content of the blood of the normal individual, and this he suggested may possibly be due to direct stimulation of the pancreas. Hunt's paper in THE LANCET was referred to in an evening paper, and when patients presented themselves with a copy and asked that since it had been shown that alcohol had an effect similar to that of insulin, might they not substitute insulin by whisky, I was able to explain to them why they must remain total abstainers if they wished to cease taking insulin in the near future.

The evidence which has made me decide that alcohol delays or prevents recovery is of the following nature:—

A man, aged 47, was alleged to have suffered from diabetes mellitus for 14 years before he sought my advice. I placed him upon a comparatively meagre diet because he weighed over 18 stone, and on it he needed 35 units of insulin twice daily to keep the sugar content of his blood below 0·15 per cent. He was in the habit of taking half a bottle of whisky daily. During the following two years the dose of insulin had to be maintained at 35 units twice daily. When I told him that I was not satisfied with his progress, and was under the impression that alcohol was delaying his recovery, he declared that he was quite willing to be a teetotaller for a time, that he had been so for a period in the past, and that

if during the first six months he were to make progress he would remain a teetotaller until he could cease taking insulin. During the following six months his dose of insulin gradually fell to two doses of 22½ units. This might at first be attributed to the reduction in total energy of his diet, but would not account for the fact that the improvement was continuous, and after three more years he was able to cease taking insulin in spite of the diet being increased.

A man over 60 who had had diabetes mellitus for many years before he sought my advice was found to need two doses of 10 units to keep the sugar content of his blood within prescribed limits. In spite of treatment his dose of insulin had to be increased gradually up to 18 units twice daily. The explanation was that he had increased his daily dose of hypnotic because insomnia had become greater; the hypnotic he was accustomed to take was a stiff whisky toddy. Some time after changing his hypnotic he was able gradually to diminish and finally cease taking insulin.

The detrimental effect was well illustrated in a young patient who, after many vicissitudes, was reducing his dose of insulin to less than 20 units daily from a maximum of over 80 units, when a gradual increase became necessary. Upon inquiry I learnt that the patient had found a new drink which tickled his palate, and of that he had been partaking freely and in increasing quantity; this drink contained quite a high percentage of alcohol.

I have heard of one case only which was alleged to have improved whilst taking moderate quantities of alcohol, and upon investigation I found that the alleged improvement was due to an increase in the renal threshold for dextrose which had apparently, but only apparently, raised his tolerance for carbohydrate. His power of storing carbohydrate had fallen. I should not be surprised to hear of a case or two recovering whilst taking moderate doses of alcohol, because the effect of the drug is so very different upon different individuals. I can record only what I have observed.

TOXINS

If alcohol were the only substance which inhibited recovery the proportion of patients who could discard insulin would be very much greater, but unfortunately there are toxins which have an equally pernicious effect.

The method of action of the toxins has not been determined, in all probability it is dual in character; they inhibit the action of insulin and thus raise the sugar content of the blood, and thereby stimulate the pancreas and probably poison the cells of the pancreas in addition.

The fact is beyond dispute that even a mild infection, such as the common cold, necessitates an increase in the dose of insulin for some time after the infection has passed. That by increasing the dose of insulin immediately upon the development of the infection the time over which the increase remains necessary seems to be reduced, points towards both of the actions mentioned above playing a part.

All infections do not have equally detrimental effect; that of the gums, first referred to[3] by me in 1917, is especially potent, whilst in my experience the chronic infection of tonsils has but little effect. The removal of septic teeth may lead to a great increase in the power of storing carbohydrate, whilst the removal of tonsils has been most disappointing. It is true that during an acute attack of tonsillitis the dose of insulin may have to be increased up to fivefold, but when the infection passes a reduction in the dose proves permissible, and no further reduction follows the removal of the infected glands at a later date. This statement is based upon observations on some two dozen cases of tonsillectomy on patients in the dietetic ward of the London Hospital.

Different microbes have different effects; I have known one patient have two attacks of what goes by the name of influenza, and at the first need no addition to the dose of insulin, whereas at the second he required the dose of insulin to be trebled for a time.

Changes which are not attributable to microbic infection, because none has been isolated and the condition is not accompanied by fever, may have an effect upon the metabolism of the diabetic subject. One of my patients required a twofold increase in his dose of insulin whilst he had a pain in a tarsal bone, in spite of his having no pyrexia, leucocytosis, nor change visible in the skiagram. Again, a second required a similar increase whilst he had ill-defined pain in a shoulder, whilst a third could make no further decrease in his dose of insulin, in spite of being a total abstainer, until he had his appendix removed.

Obviously there are factors affecting the metabolism and the action of insulin which we have to discover by investigation of those patients who remain stationary or become worse. The exanthems appear to be especially destructive to the pancreas, and that is one of the reasons why diabetes mellitus is so grave a disease in the very young.

REPEATED ATTACKS

Repeated attacks of diabetes mellitus fortunately are rare. They are recognised with ease when they occur; the signs and symptoms are identical to those of the first attack and do not suggest any acute infection in so far as there is no malaise, pain, or pyrexia.

It might be argued that these further attacks are due to some infection which cannot be detected. I cannot refute that explanation, but should suggest that the first attack might be due to the same cause, and therefore it is reasonable to refer to the sudden exacerbation of the disease as a second attack.

The following Table includes only those patients who have been able to dispense with insulin and continued to report progress.

Sex and age.	Interval.*	Beginning of treatment.		End of treatment.†	Sex and age.	Interval.*	Beginning of treatment.		End of treatment.†
		Diet.	Units of insulin.	Diet.			Diet.	Units of insulin.	Diet.
		(g.)		(g.)			(g.)		(g.)
M 60	1/12	250	105	250	M 49	1/12	116	30	250
M 47	14	145	70	185	M 54	2/12	110	25	200
M 65	4	195	70	195	M 46	2/12	168	25	168
F 52	1	215	70	215	M 43	1	180	20	180
M 34	3/12	150	50	150	M 47	2	115	20	300
M 54	3/12	110	40	194	F 65	3/12	100	20	150
M 63	1/12	111	40	204	M 56	4	230	20	250
M 53	20	240	36	240	F 57	2/12	114	20	130
M 61	3/12	99	30	170	M 65	8	174	20	174
M 66	1/12	135	30	300	M 40	10/12	180	10	180

(g.) = total potential carbohydrate expressed in grammes.

* Interval in years between onset and treatment with insulin.

† Units of insulin required at end of treatment = nil.

Three of the patients have relapsed, owing to severe infection or return to alcohol. Only four of the cases have been free from insulin for periods in the region of seven years.

My reply to the question, "Does insulin cure diabetes mellitus?" is "Yes, if given in adequate dose and if the patient can be protected from adverse influences."

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THE SILICA CONTENT OF LUNGS*

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OF the wide range of dusty materials which gain lodgment in human lungs, those containing silica, either free or in combination, appear to be of the greatest importance, partly from the frequency with which this material forms a portion of inhaled dust, and partly from the close association proved to exist between the inhalation of siliceous particles and the development of fibrosis of the lungs.

A valuable method of approach to the study of those forms of pneumoconiosis associated with silica is that of chemical analysis of post-mortem lungs. I have had numerous opportunities of studying the lungs of coal-miners and associated workers in the South Wales coal-field and, in collaboration with Lyle Cummins, a detailed study of some 35 post-mortem lungs was published [1] in 1930. This appears to have established beyond doubt the fact that fibrosis of the lungs is relatively common amongst Welsh coal-miners, that it reaches a disabling or even fatal stage amongst those whose work especially exposes them to stone-dust, and that it is always associated with silica which in the fatal cases is present in amounts quite comparable with those found in the lungs of quartz-miners in South Africa.

Since 1930 further opportunities have occurred for examination and analysis of fibrotic lungs from a number of industrial workers not solely coal-miners, and from this collection of material it appears to be worth making an attempt to deduce some standards as to the silica content of lungs and its relation to lung fibrosis. This has been done by tabulating the percentages of silica (free and combined) found in the dried lung tissues and correlating with the extent of fibrosis and pulmonary disability so far as these factors can be expressed quantitatively. The cases for consideration are 60 in number, and include "hard-heading" workers in collieries, ordinary colliers from the coal-face, stone-masons, coal-trimmers, a boiler-flue cleaner, and, by courtesy of Dr. Charles Sutherland, potters and a ganister worker. There are, in addition, lungs from a number of other industrial workers to serve as controls.

The Tables I. to VI. are arranged in serial order according to the proportion of silica found, and the amount of fibrosis of the lungs as ascertained post mortem is classified under five headings which explain themselves. The presence of tuberculosis when definitely established is recorded in the Tables, but the importance of this and other secondary infections is not discussed here, not from any intention of minimising their moment in a study of pneumoconiosis, but because for purposes of this publication my concern is chiefly with the chemical aspect and the possibility of arriving at standards as regards silica.

SIZE OF PARTICLES

The Australian [2] and South African [3] work has shown the importance of the size of silica particles inhaled, and probably of the silica being in the uncombined state. C. A. Seyler, a well-known authority on the chemistry of coal, has suggested to me that the question of the free or combined state of the silica in rock is important more from mechanical than from chemical considerations. When a rock contains a low percentage of free silica fragments of this are embedded in a relatively soft matrix as in shales; the softness of the matrix enables the rock to be broken or pierced without the use of high-speed drills, and such dust as is formed, though containing free silica, will be presented in relatively large particles which will either settle so quickly as not to reach the respiratory passages, or be detained in the nasal passages and fail to reach the lung alveoli.

With silicates, as in shales, this degree of subdivision may be of greater importance in determining the extent of fibrosis than any lower degree of chemical activity within the lung tissues. This aspect of the silicosis problem demands the coöperation of geologists and physicists with our own profession, for the existing official view that silicosis

TABLE I.—*Total Silica less than 0·30 per cent. of Dried Lung Substance*

Case	Age.	Main cause of death.	Fibrosis of lungs.	Occupation.	Silica % of lung.
1	30	Pulmonary tuberculosis.	Slight.	Silica brick-maker.	Nil.
2	55	Cardiac fibrosis.	None.	Dock-labourer.	0·06
3	44	Carcinomatosis primary in lung.	Slight.	Coal-trimmer.	0·10
4	55	Peritonitis, gastric ulcer.	None.	Ship's fireman.	0·10
5	72	Accident, fractured skull.	,,	Copper worker.	0·11
6	23	Lymphadenoma.	,,	Tin worker.	0·11
7	57	Pyonephrosis, pneumonia.	,,	Coal-trimmer.	0·18
8	60	Accident, fractured pelvis.	Slight.	,, ,,	0·19
9	?	Cerebral tumour, ? gumma, carcinoma of lung.	,,	Ganister miner.	0·20

Comment.—Lung fibrosis absent or trivial or accounted for by causes other than silica.

TABLE II.—*Total Silica between 0·30 and 0·60 per cent. of Dried Lung Substance*

10	62	Peritonitis, appendicitis.	Slight.	Coal-trimmer.	0·37
11	58	Fractured ribs, empyema.	Much.	Colliery manager, anthracite.	0·42
12	58	Cardiac, pulmonary, ? gumma of lung.	,,	Stone-mason.	0·42
13	37	Accident, fractured skull.	Slight.	Coal-miner, anthracite.	0·52
14	72	Pulmonary tuberculosis.	Definite.	Boiler-flue cleaner.	0·53
15	47	Accident, fractured skull.	Slight.	Coal-miner, anthracite.	0·55

Comment.—Lung fibrosis present in varying degrees but not of itself serious except when factors other than silica account for the condition—e.g., Cases 11, 12, and 14.

TABLE III.—*Total Silica between 0·60 and 1·0 per cent. of Dried Lung Substance*

16	64	Accident, fractured skull.	Much.	Coal-miner, steam coal.	0·64
17	58	Pericarditis.	Definite.	Stone-mason.	0·68
18	45	Pernicious anæmia.	Much.	Coal-miner, anthracite.	0·76
19	51	Chronic interstitial nephritis.	Slight.	,, ,,	0·76
20	44	Cerebral tumour.	,,	Coal-miner, overman, anthracite.	0·77
21	56	Progressive muscular atrophy.	,,	Coal-miner, anthracite.	0·87
22	59	Pulmonary, with tuberculosis.	Much.	Repairer, anthracite.	0·94
23	36	,, ,,	Intense.	Hard-heading coal-miner, hard coal.	0·97

Comment.—Fibrosis often advanced but "pulmonary" deaths only occurring when tuberculosis intervenes.

* Based upon a contribution to a discussion on the pneumoconioses held in the section of pathology at the British Medical Association's centenary meeting, 1932.

TABLE IV.—*Total Silica between 1·0 and 1·6 per cent. of Dried Lung Substance*

Case	Age.	Main cause of death.	Fibrosis of lungs.	Occupation.	Silica % of lung.
24	62	Pulmonary, with tuberculosis and carcinoma of lung.	Much.	Coal-miner, anthracite.	1·02
25	59	Fatty heart rupture.	Slight.	,, ,,	1·03
26	69	Pneumonia.	Definite.	,, ,,	1·04
27	56	Pulmonary.	Much.	,, ,,	1·08
28	47	,,	Intense.	Repairer and hard-headings, anthracite.	1·10
29	56	Pulmonary, with tuberculosis.	Much.	Coal-miner, soft coal.	1·12
30	59	Pulmonary.	,,	Coal-miner, anthracite.	1·20
31	63	Septicæmia.	Definite.	Repairer, anthracite.	1·20
32	48	Pernicious anæmia.	Much.	Coal-miner, house coal.	1·27
33	53	Pyloric carcinoma.	Definite.	Repairer, hard coal.	1·32
34	54	Toxic nephritis, peritonitis.	,,	Coal-miner, anthracite.	1·45
35	62	Pulmonary, fatty heart.	Much.	,, ,,	1·50
36	43	Pulmonary, with tuberculosis.	Intense.	Coal-miner, hard coal.	1·50
37	36	Addison's disease.	Definite.	,, ,,	1·50
38	51	Cardiac.	,,	Coal-miner, anthracite.	1·52
39	55	Pulmonary, with tuberculosis.	Much.	,, ,,	1·54

Comment.—In every case except Case 25 fibrosis was a leading feature and "pulmonary" deaths frequent.

TABLE V.—*Total Silica between 1·6 and 2·4 per cent. of Dried Lung Substance*

40	50	Pulmonary.	Intense.	Coal-miner, anthracite.	1·72
41	?	,,	Much.	Potter.	1·78
42	53	Pulmonary, with tuberculosis.	,,	Coal-miner, anthracite.	1·80
43	53	Pneumonia.	Definite.	,, ,,	1·78
44	57	Cholangitis, pneumonia.	Much.	Repairer, anthracite.	1·91
45	26	Pulmonary, with tuberculosis.	Definite.	Coal-miner, anthracite.	1·98
46	52	Pulmonary.	Intense.	Coal-miner, soft coal.	2·08
47	51	Pulmonary, with tuberculosis.	,,	Coal-miner, hard coal.	2·16
48	57	,, ,,	Much.	Hard headings, hard coal-mines.	2·28

Comment.—In every case important fibrosis, often with tuberculosis, and "pulmonary" deaths with only one exception.

TABLE VI.—*Total Silica exceeding 2·4 per cent. of Dried Lung Substance*

49	60	Pulmonary.	Intense.	Potter.	2·69
50	52	Fatty heart, pulmonary.	,,	Hard headings, anthracite.	2·69
51	51	Pulmonary.	,,	,, ,,	3·18
52	44	Pulmonary, with tuberculosis.	Much.	Coal-miner, anthracite.	3·22
53	59	Fatty heart, pulmonary.	,,	,, ,,	3·20
54	53	Pulmonary.	Intense.	Coal-miner, hard coal.	3·30
55	55	,,	,,	Hard headings, rock borings.	3·45
56	41	,,	,,	Hard headings, hard coal-mines.	3·79
57	48	,,	,,	Hard headings, anthracite.	3·91
58	53	Accident, fractured skull.	,,	Plasterer; coal-miner, soft coal.	4·07
59	52	Pulmonary.	,,	Coal-miner, anthracite.	4·28
60	?	,,	,,	Coal-miner, hard coal.	4·76

Comment.—Lung fibrosis advanced in every case and deaths mainly due to this, Case 58 excepted.

can be caused only by "free" silica may yet require reconsideration.

As pointed out by Kettle,[4] the pioneer South African work on silicosis as found in the Rand miners has somewhat overshadowed the subject, and this may have tended to minimise unduly a realisation of the possible influence of "combined" silica as an agent of fibrosis. Badham,[5 6] in New South Wales, is by no means assured that silicates are harmless, and Kettle's recent experimental work[7] on the effects of kaolin (containing combined silica) and the contrasted inert behaviour of silicon carbide, is very pertinent.

It would be of some assistance at least if it were possible to get accurate differentiation between free and combined silica in the lung tissue, but there are serious practical difficulties in the satisfactory determination of free silica in lung material, nor would a perfect method of analysis enable us to trace the fate of inhaled free silica after solution had converted it presumably to silicate within the tissues.

Many observers have noted the presence of doubly refractile particles in fibrotic lung tissues, and have perhaps assumed that these represent free silica. A survey of many lung sections by Cummins and myself leads us to the conclusion that although there is a rough correlation between the number of such particles and the presence of silicotic fibrosis in histological sections, nevertheless there are too many technical difficulties to make the method in any sense quantitative at least in the hands of those untrained in petrological technique. In most lung sections the refractile particles are extremely small, very seldom exceeding 3 microns in diameter. A factor to be remembered is the length of time any particle has been present in the lung tissues; if it be accepted that a slow process of solution precedes the fibrotic activity of the silica, then the size of any particle must gradually diminish as its substance becomes dissolved and toxic to the surrounding tissues.

SILICA AND THE COAL-MINER

In the paper by Cummins and Sladden[1] there was ample evidence adduced to show that fibrosis of lungs of an advanced degree is not uncommon amongst Welsh coal-miners; many of their observations were made upon workers from the western end of the coal-field where anthracite is mined, but examples of advanced silicosis are not lacking in the mines further east where steam-coals and soft-coals are got, and some are included in the Tables given here. In every case of advanced fibrosis and "anthracosis" silica has been found present in important amount, and the opinion is expressed in the paper quoted that the silica found is sufficient to account for the fibrosis, the carbonaceous ("anthracotic") dust being accumulated by reason of impairment of the lymph drainage of the lungs. If this explanation be correct, one would expect a cumulative addition, both of silica and of coal-dust, in those who continue to work in an atmosphere heavily charged with these materials when once their lungs have become substantially damaged.

Research in America[8] has shown that of all dusts to which industrial workers may be exposed, "coal-dust" in the mines is the most concentrated. The American figures showed an average of more than 8000 dust particles (of less than 10 microns diameter) per cubic centimetre of air. Since the "coal-dust" of mines contains a proportion of siliceous matter—0·6 per cent. or more according to Redmayne—an atmosphere so dusty will actually contain about

50 particles of siliceous matter per c.cm. The lowest "danger limit" agreed, both in Australia and South Africa, for the purer forms of silica is 200 particles per c.cm.; it follows that the very concentrated dust of a coal-mine though containing some silica will not ordinarily reach the danger level for this substance; nevertheless it would appear to be quite possible to inhale as much as 2 mg. of actual silica in these conditions during a day's work. At that rate, working 250 days a year, 0·5 g. of silica might reach the lungs in a year, and in ten years as much as 5·0 g. could be inhaled, though not necessarily retained completely.

In a study of the lungs of 24 coal-miners whose deaths were attributable to accident or illness and not especially to lung fibrosis, analyses showed an average of 4·1 g. total silica in the lungs of each man (1·15 per cent. of the dried lung). The ages of these men ranged from 36 to 69, and a study of the total silica content in relation to the ages is of interest; five men were below the age of 50, and their silica totals averaged 2·0 g.; for the remainder, 19 men over the age of 50 years, the average total was 4·5 g. None of these men was known to have been especially engaged in boring rock; they were representative of "ordinary" coal-miners exposed to the ordinary conditions of work underground. It may be taken that most of them started work in the mines at about 15, so that their total time of exposure to mine dust of all kinds varied from 20 to over 50 years. From the previous calculation, during such periods of time a total quantity of from 10 to 25 g. of silica is likely to have had access to the lungs. Since the amounts found were substantially less than these figures an important proportion of the silica inbreathed must have been disposed of by the drainage mechanisms of the lungs and passed on to other parts of the body or excreted.

That such disposal of silica can occur to some extent was first shown by Pirie and Mavrogordato,[9] who demonstrated the passage of silica to lymph glands below the diaphragm, and their observations were later repeated and confirmed by actual chemical analyses of lymph glands (Tideswell in ref. 1).

These figures and observations suggest that in the "ordinary" coal-miner exposed to minimal doses of silica year by year, the silica accumulates only slowly, a substantial part being in the earlier years passed on from the lungs. A prolonged or more intensive "bombardment" of the lungs causes progressive damage to the lymphatics, and favours an accelerating rate of accumulation of dust, siliceous or other, so that after age 50 the damage to the lungs from the silica fraction may have assumed serious proportions. Experience amongst the Welsh coal-miners certainly indicates 50 to 53 years as the "critical age" in this respect.

In those men who as rock-drillers (hard-heading workers) are exposed to a higher concentration of silica dust the cumulative effect is accentuated, and once the condition of silicotic fibrosis is established there is no chance of repair.

COAL-DUST ONLY

A study of some material available from coal-trimmers leads to the conclusion that coal-dust alone, apart from silica, cannot be regarded as a cause of serious fibrosis of lungs, and such minimal fibrosis as does occur in this class of worker can be explained as due to the action of traces of siliceous dust present even in high-grade "pure" coal.

Collis and Gilchrist[10] have shown from the Registrar-General's returns that coal-trimmers, like coal-miners, have an excessive mortality-rate from pneumonia and bronchitis, but fibrosis of lungs comparable with that found in rock-drillers or even in coal-miners has yet to be demonstrated among coal-trimmers.

In Tables I. and II. are given lung analyses from four trimmers and one ship's fireman, a comparable employment; their silica content is not high, though it will be noted that four of these men were well over the age of 50 and had had, so far as could be ascertained, many years of exposure to concentrated coal-dust. It is noteworthy that the older the men the higher was the percentage silica content in this small group.

SILICA QUANTITIES

In considering silica as a cause of pneumoconiosis it has to be remembered that the degree of fibrosis caused will be dependent upon a number of factors in addition to the most obvious one—viz., the amount of silica retained in the lungs. Such factors are the chemical state, free or combined, of the siliceous particles influencing their solubility in the tissues, the size and conformation of the particles, the presence of any non-siliceous coating or matrix on the particles, and, not least important, the period of time since the access of particles to the lungs. None of these factors is in practice easy to determine except the first, and that of course only in fatal cases.

How far then is it possible to say, with reasonable assurance, that a given fatal case has died as a result of "silicosis" when, as so often happens, the lung fibrosis found has been accompanied by pulmonary infections, tuberculous or other, and the heart condition itself has been an important factor in the death? On the basis of the experience related here I conclude that fibrosis of an important extent, clearly contributory towards death, is usually present when the silica content of the lungs determined chemically exceeds 1·0 per cent. of the dried lung substance. Quantities below this are not necessarily negligible but have seldom been associated with deaths attributable to pulmonary disease except when tuberculosis has intervened. When the silica content exceeds 1·6 per cent. the fibrosis associated is with practically no exceptions very severe and sufficient in itself to lead to death; this accords with the published records of many observers from various parts of the world. The analyses recorded here suggest that a silica content of as much as 1·6 per cent. causes so much damage to the pulmonary drainage system that the accumulation of further dust inhaled is rapidly accelerated; exposure therefore to silica risk at this stage greatly enhances the danger to life.

I desire to tender my thanks for the silica determinations to Mr. F. V. Tideswell, D.Sc., of the Safety in Mines Research Department at Sheffield, and to Mr. Clarence Seyler, of Swansea, and to acknowledge much valuable encouragement and advice from Prof. Lyle Cummins.

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OBSERVATIONS ON LICHEN URTICATUS

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Lichen urticatus is one of the commoner skin complaints of children. According to figures published by Hallam,[1] it has furnished over 10 per cent. of all skin complaints seen at three children's hospitals in London during the years 1927–1930. The clinical picture and pathology are reasonably well established. Unfortunately, however, this is not the case with its ætiology.

Bateman was the first to describe the condition, in 1824, and his classical account has needed little further amplification to this day. Its diagnosis then usually presents little difficulty. It is by no means uncommon, however, in the out-patient department, for a mother whose child is a chronic sufferer to come up with the request "would the doctor kindly give her a certificate to the effect that the child has not got chicken-pox, as the new school doctor (or nurse) will insist that it has." Recently Chalke [2] has pointed out that cases have been referred to medical officers of health and to fever hospitals with the provisional diagnosis of small-pox. Occasionally difficulty can arise with the differential diagnosis of scabies, particularly when the lichen urticatus papules are secondarily infected.

Borderline cases are sometimes seen which tend to approximate to the condition known as prurigo of Hebra. Fully developed cases of this disorder appear to be much rarer in this country than in middle Europe. Ocasionally, however, pruriginous eruptions in children are so widespread and chronic that, even in the absence of lichenification and secondary eczematisation, it is difficult to consider them as only lichen urticatus. Possibly the two conditions are simply variants. Brocq [3] long ago pointed out that a whole uninterrupted series of "faits de passage" existed between urticaria, prurigo simplex (lichen urticatus), and prurigo of Hebra. Urticaria as seen in the adult is rarely seen in children and, vice versa, papular urticaria with well-marked vesicle formation is uncommon in adults. There are, however, so many points of similarity between the conditions that it is probably correct to consider their pathology as identical. They are both examples of the triple skin response of Sir Thomas Lewis, which is exactly reproduced experimentally by the action of histamine. It is supposed that histamine may be liberated in the cells of the skin by an antigen-antibody interaction. Such antigens are assumed to be most usually, but not necessarily always, of a protein nature.

Lichen urticatus would therefore fall into the group of allergic phenomena which provide one of the most difficult ætiological problems of medicine; as J. Freeman has pointed out, sufferers are apt to consult every type of specialist in turn. The lichen urticatus sufferer is perhaps luckier than most in that the condition is almost always temporary and disappears with the passing years.

ÆTIOLOGY

It must be stressed that there are many difficulties in trying to establish the ætiology of lichen urticatus. Mild cases are numerous and spontaneous recovery common. The majority of cases, therefore, are probably not seen either by the pædiatrician or the dermatologist or, indeed, by any doctor.

Most of the papers which have appeared on the subject (and this one is no exception) are based on only about 50 cases. There must be many sources of error in trying to establish any conclusions on so small a number of patients out of such a potentially large number of sufferers. In the past the most popular ætiological factor has undoubtedly been the alimentary one. The laity have for long associated urticaria with fish poisoning, and similarly lichen urticatus has usually been regarded as due to some dietary indiscretion. It is now well established that urticaria of adults can apparently be caused by a variety of factors other than alimentary, such as bacterial toxins, drugs, or simply emotion. Similarly, in lichen urticatus there are reasons for supposing that the alimentary factor is by no means solely responsible.

Hallam [4] in 1927 pointed out that in a series of cases thoroughly investigated by him recovery was the rule simply on admission to hospital, without any other treatment. As far as possible the diet given was the same as the patient had previously received in his own home. Hallam therefore concluded that food did not cause the condition in any way. As Lancashire [5] pointed out, there is here, of course, a possibility of error in that many odds and ends of diet might be given in the child's home which would not be classed by the parents as "diet." More recently, however, Hallam [6] has found that similar cure results simply from admitting the patients to hospital for the night and allowing them to spend the day in their ordinary milieu. He suspects the presence of an antigenic factor in the home bedding, but has so far been unable to detect it.

Corson [7] in America has investigated 31 cases very thoroughly from a biochemical point of view with almost entirely negative results. His conclusion is: "that very little information can be gained about this condition from laboratory studies." In only two of his cases was anything in the nature of a definite causative agent discovered. In one this was an oxyuris infection, in the other a sensitisation to egg and milk, as evidenced by skin tests. In both cases spontaneous cure was said to result upon taking suitable remedial measures.

One common factor is usually mentioned by all investigators—namely, heat. The condition is more common in the summer months. It is in fact frequently known by the mothers by the apt synonym of "heat spots," though they usually regard the excessive heat as being present in the child's blood. It is certainly very noticeable that many of the sufferers, even in the warmest of weathers, are encased in layers of woolly garments which must act as irritants, both mechanical and thermal.

In a review of 50 unselected cases seen during the last year at the Princess Elizabeth of York Hospital, Shadwell, the skin department of St. Bartholomew's Hospital, and elsewhere, I have been impressed by the possibility of a nervous factor in many cases. The mother's statement that the child is "a bundle of nerves" may not have any great scientific significance; it is, however, an objective observation which is perhaps too readily dismissed in the rush of an out-patient clinic, and may, indeed, have more bearing on the case than the most elaborate laboratory study. In talking to mothers, as far as possible without putting leading questions, this statement as to the child's temperament has been so often made that it was determined to follow it

up. The mothers have been in all cases questioned as to:

1. Whether they have noticed that any particular article of food brings on an attack.
2. The "child rank" of the patient, and whether other children in the family, if any, have had attacks.
3. The child's general disposition—particularly in comparison with the rest of the family.
4. What effect changes of habitat, such as holidays or visits to relations, have had on the attacks.

It appears, firstly, in so far as one is justified in attempting to draw any deductions from such small figures, that the condition is particularly common in only-children or the first child; 50 per cent. belonged to this group. Next in frequency was the baby of the family or the youngest child, 25 per cent. belonging to this group. This finding cannot be regarded very seriously, but it is interesting in the light of some psychologists'—notably Adler's—views as to the importance of these two child ranks in producing neuroses. In 30 per cent. there was what one might call a definitely "nervous" history. Since many of them were, at any rate for the time being, only-children, this is perhaps not surprising. The mothers' statements were, however, more convincing when there were other children in the family, and it was surprising how often the lichen urticatus sufferer was the only one in the family with whom the mother had had "trouble." "It was so different from the others"; "jumps at the least thing"; "cries for no reason when spoken to"; "fidgets and wakes up screaming at night": are a fair selection from the notes taken. It may be said that these characteristics might be expected in a child with an irritable skin eruption, but the more intelligent mothers were quite definite that the eruption often followed an exacerbation of the "nerves," and did not precede it. In some cases they could foretell an attack by a day or two from the child's general demeanour.

In 10 per cent. the first attack was said to have followed an accident or shock, such as a bad fall. These mishaps are, of course, relatively common in childhood, and coincidence cannot be discounted. As an observation, however, it is as valid as, for example, an attack being noticed to occur after a meal of fried fish.

In two cases, both of the chronic intermittent variety, the child was said to be the reverse of nervous, being particularly daredevil and of the ringleader type.

Two histories in detail were:

1. Girl, aged 5. Bright, intelligent appearance. Said by her mother to have had two attacks in her life. The first was when, aged 3, she witnessed a brother being involved in a street accident. The second attack occurred recently and had lasted three weeks. The mother could not account for it, but mentioned that it had synchronised with the child going to school for the first time in boots. On investigation it appeared that the little girl had always worn shoes with buckles, and was extremely clumsy in undoing boots with laces, to which she was unaccustomed. At her school during some gymnastic performance, the children had to take off their boots, and this little girl, though top of the class, incurred the ridicule of the class and reprimands of the teacher by her slowness and clumsiness in struggling with her boots. The suggestion that boot drill be provided at home apparently proved beneficial, for the condition cleared up rapidly.

2. Girl, aged 4. Youngest child of four brothers. Attacks had lasted intermittently since 18 months old. The child was said to be "very different" from all the brothers, in that the methods employed in dealing with them did not appear to work with her. Appeared to resent being made to sleep separately from her mother. Attempts to make her do so always resulted in bad attacks.

It was particularly noticeable that such histories were commonest in the more chronic type of case.

With regard to food, the usual report was that the spots were made worse by some articles of diet, excess of sweets and porridge being most often incriminated. In no case, however, could a clear history be established of attacks following the resumption of some article of diet which had been previously omitted. This was tried with bananas, egg-white, milk, porridge, and sweets. In general, the effect of food seemed very difficult to assess, and to depend more on an unbalanced diet than a food idiosyncrasy.

Changes of habitat seemed in some cases to bring on attacks. In three cases it was mentioned that attacks always occurred when the child went to the sea. On the other hand, a bad bout always seemed to be cured by "a change of air."

The exanthemata figure as a very real predisposing factor—"he (or she) came out in them when he (or she) came back from the fever hospital"—occurred in ten cases; in five of them this was the first attack, and in three there had been no previous attacks for some months. It appears that after the exanthemata the skin possibly remains for some time in a state of locus minoris resistentiæ.

Many of the cases, on account of their tender years, had escaped tonsillectomy. The evidence of nasopharyngeal infections as a predisposing cause was not very marked. In a few cases sore-throats were doubtfully regarded as preceding attacks. In two instances when septic tonsils had been removed the condition had cleared up for two months and then relapsed in statu quo. In only half a dozen instances was more than one member of the family affected, which would seem to render an exogenous ætiology such as insect bites unlikely.

TREATMENT

Only four cases were admitted to hospital; these all rapidly improved, fresh lesions ceasing to appear very soon after admission. All the cases at some period or other were put on a bromide mixture containing ammonium bromide grs. i–ii for each year of life, t.d.s., and given a calamine and phenol lotion. As an adjuvant in some cases, particularly in pale debilitated-looking children, general carbon-arc baths appeared to be of great value.

Starting with a profound scepticism as to the result of any internal treatment, I was impressed with the unexpectedly good results. It cannot be pretended that all cases were rapidly cured. Since the condition, at any rate in my opinion, is of the nature of a syndrome, it is unlikely that any uniform line of treatment, particularly by drugs, will be universally applicable. But the results were definitely better than those which resulted in previous years from the administration of "hyd. cum cret." or "gent. cum rheo." Five cases of the chronic type with a well-marked "nervous" history remained well while on the bromide mixture, but relapsed on stopping it. They had all had previous treatment with the other drugs as well as attempted desensitisation with Aolan, both subcutaneously and intradermally—all without result. In two cases, when the mother had noted a well-marked "food" history, fresh attacks did not occur whilst on the mixture, though the incriminated foods were again introduced into the dietary.

DISCUSSION

"Post hoc propter hoc" is notoriously an unsatisfactory method of attempting to establish an ætiology, and lichen urticatus is a particularly

unsatisfactory condition in which to try out this hoary method. As has been stressed before, spontaneous and unaccountable recovery is common. Patients are also difficult to control. Many of them do not return for examination, even though asked to. Possibly they recover, but quite probably the mother ceases to worry when she gathers that the condition is not infectious. When parents are brought under control—i.e., in hospital—they all apparently get better.

That a skin lesion—in a child said to be "nervous"—should improve upon the administration of bromides is obviously very slender proof that such a condition should be considered to be what W. J. O'Donovan calls a "dermatological neurosis." It is not pretended that lichen urticatus is this in every case. It can certainly be the result of an overloaded colon, a food idiosyncrasy—as in a case quoted by Burgess [8]—or indeed from any peripheral irritation. There are, however, some general considerations which suggest that in some cases at any rate a psychological factor, in the widest sense of the term, may play a greater part than has usually been admitted.

1. The alimentary factor must be largely discredited if Hallam's observations are confirmed.

2. It is perfectly possible that the beneficial effect of hospitalisation may be due to an antigenic factor in the child's home; the psychological explanation is as simple. Far less dramatic changes of air seem to act as curatives. There must be many factors in the sleeping arrangements of the poorer families, who are so particularly susceptible to lichen urticatus, which can give rise to mental trauma as well as physical discomfort.

3. Shock and anxiety states have often enough been recorded as apparently the only cause of an acute attack of urticaria. In the writer's opinion an underlying disturbed mental state is the commonest finding in chronic cases.

4. In all allergic phenomena, particularly asthma and eczema, the psychogenic factor is regarded as of great importance. Whether it is only a predisposing condition or a direct causative agent is still a matter of opinion.

5. Even in such a definite dermatological condition as lichen planus, with its well-marked histopathology, there is so frequently a history of strain, worry, anxiety, or shock, that one is tempted to credit such factors with being direct causative agents. Though by what mechanism an anxiety state produces a lichen planus papule is certainly not yet explained except by invoking the endocrino-sympathetic system.

It is interesting to note that the carbon arc has proved beneficial, since heat is so universally regarded as a causal factor. Undoubtedly part of its beneficial action has been simply in aiding the skin to perform its natural function by the stimulation of light and air, from which the bodies of so many poor children are still rigorously excluded. In one child—definitely of the prurigo Hebra type—under observation for two years, actinotherapy, in default of heliotherapy, was the only thing which helped in the slightest. On two occasions he went to Hayling Island for a sojourn of two months, and on both occasions came back completely free. He relapsed after a few weeks on being reintroduced into his home circle, which was of the most unfortunate nature, including a hopelessly ignorant mother who insisted on scrubbing him with ung. sulph. and hermetically sealing him in filthy woollen garments.

In addition, however, to this "nature cure" effect, actinotherapy is credited with having a direct effect on the metabolism and the endocrino-sympathetic system. This seems not unreasonable when one considers the intimate connexion of the sympathetic system with the skin.

I wish to express my thanks to Dr. A. C. Roxburgh for permission and encouragement to investigate cases seen at St. Bartholomew's Hospital.

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Clinical and Laboratory Notes

TEMPORO-SPHENOIDAL ABSCESS DUE TO A VARIANT OF FRIEDLÄNDER'S PNEUMOBACILLUS

BY J. GAY FRENCH, M.S. LOND., F.R.C.S. ENG.

SENIOR SURGEON, EAR, NOSE AND THROAT DEPARTMENT, ROYAL FREE HOSPITAL, LONDON

THE patient, an agricultural labourer aged 39, was admitted to the Royal Free Hospital on Jan. 9th, 1933, with the history of an acute left earache with discharge. This commenced a week before Christmas, 1932. On Dec. 23rd he developed facial paralysis and on Jan. 9th he became comatose and was sent up from the local hospital.

On admission he was roused with difficulty when shouted at, but would sink again into the comatose condition. Temperature 99° F., pulse-rate 56, respirations 20. Examination locally showed the left external auditory meatus to be full of pus, and a marked swelling and tenderness existed over the mastoid process. In addition there was a complete infranuclear facial paralysis of the same side and on ophthalmoscopic examination papilloedema of the left fundus oculi.

Lumbar puncture was performed, the cerebro-spinal fluid came out turbid and under considerable pressure. Pathological report stated 740 cells per c.mm., chiefly polymorphonuclears with a fair number of large endothelial cells; no organisms could be detected with Gram and methylene-blue stains. Cultures were negative at the end of 15 hours. After the lumbar puncture the patient became much less drowsy and could answer questions, but again lapsed into his comatose condition within half an hour.

Operation was performed the same evening, under intratracheal ether. The mastoid was opened and was found to be of a very sclerotic type, the antrum was small and full of pus, the whole roof of the attic had undergone necrosis; oedematous granulation tissue over the dura mater projected into the attic. The mastoid incision was carried upward over the left temporal and parietal bones and the skull opened. The dura bulged into the wound under considerable tension, no pulsation being present. A vertical incision through the dura was made over the temporo-sphenoidal area, and a brain forceps introduced in a forward and downward direction—a quantity of thick brown and very offensive pus under definite pressure shot out of the wound; the cavity was about the size of a hen's egg with necrotic walls. This was washed out with hot 1 in 2000 hydrarg. perchlor. solution, and a rubber drainage-tube fixed in position, the wound being left open with the rubber drainage-tube in the abscess cavity and sutured to the skin.

Further course.—The patient remained in a comatose condition for eight days with incontinence of urine and faeces. At 3 P.M. on the day after the operation 20 c.cm. of a 0·5 per cent. solution of mercurochrome were injected intravenously. This was repeated at 8 P.M. and again

on the following morning, making 60 c.cm. in all. Hypertonic saline was given by rectum.

On Jan. 15th the pulse-rate had risen to 72, the temperature remaining at 99°. On the 18th he developed a paralysis of the right arm which cleared up six days later. On the 19th he seemed more alert and intelligent and did not lapse into coma again. By the 27th the facial paralysis cleared up completely. He was discharged to a convalescent home on Feb. 2nd.

The pathological report was as follows: "The organism isolated from the cerebral abscess is a Gram-negative non-motile bacillus forming white slimy colonies on ordinary media, offensive smell on culture, but not liquefying gelatin nor forming indol. Saccharolytic properties limited to fermentation of glucose. The organism is best classed as a variant of Friedländer's pneumobacillus."

I have to thank my house surgeon, Miss I. M. Cullum, M.B., for the notes.

DECOMPOSITION OF ANÆSTHETIC ETHER

A SIMPLE PREVENTIVE

BY H. O. NOLAN, LL.D., M.D. LOND., F.I.C.

THE occasional untoward effects of ether on the respiratory organs are generally attributed to oxidation products, especially peroxides. Anæsthetic ether now comes to us free, or almost free of peroxides. But, in contact with air, these soon form; exposure to light accelerates the oxidation. A partly used bottle of ether need stand but a short time for its contents to give a strong peroxide reaction.

Ideally, one should reject, for purposes of anæsthesia, any ether contained in a bottle which has stood after being opened and partly emptied. But this is, for the general practitioner, a counsel of perfection. A simple and certain method of preventing the oxidation of ether should, therefore, be welcome. Such a method is the addition of a trace of hydroquinone; half a grain (a very small pinch) to 4 oz. of ether is sufficient; excess is harmless.

In an experiment that I made in the laboratory of Sir Frederick Hopkins, at Cambridge, a trace of hydroquinone completely prevented the formation of peroxide in ether contained in a colourless, half-empty bottle exposed, during six months, to diffused light with occasional sunshine. A control, standing beside the test, gave a strong peroxide reaction. Resorcinol (resorcin), though not entirely without action, was very much less effective than hydroquinone. Afterwards I learned that an immeasurably more thorough investigation of ether oxidation had already been carried out by Mr. Geoffrey Middleton in the laboratories of British Drug Houses, Ltd. Mr. Middleton, also, had found that hydroquinone (as well as benzidine and pyrogallol), in minute quantities, prevented the spontaneous oxidation of ether. One part of hydroquinone to 5000 parts of ether is sufficient.

Hydroquinone is odourless and non-volatile; it is, therefore, harmless to the patient. It can be bought anywhere.

This use of hydroquinone is an extension of Moureu's work on the amazing anti-oxidant catalytic action of aromatic hydroxy-compounds, especially those having two hydroxyls in the ortho- or in the para-position. Those with the hydroxyls in the meta-position are much less active; hence the relative inefficacy of resorcinol.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF UROLOGY

AT a meeting of this section held on July 6th the chair was taken by Mr. CLIFFORD MORSON, the incoming president. An address on

Conservation in Urology

was read by Dr. HENRY G. BUGBEE (New York). He said that the advance in the last decade and the general trend of urology to-day could be best summed up in the one word conservation. The progress from diagnostician to therapeutist and surgeon had been a logical one for the urologist, but the first two decades of the century had largely been occupied by the specialty's struggle for recognition. The rôle of the general surgeon in urology was that of a technician, for he was but carrying out specifications supplied by the urologist, who was, moreover, better fitted to carry out the important preparation and after-care. There had been an evolution in methods of restoring urinary function, and first of all factors in this process had been realisation of the association between the urinary system and other parts of the body, and the general study of infection and the body's resistance to it. The removal of the primary focus might be a simple matter or might involve complicated investigations of the bodily functions. The endothelial cells of the kidney capillaries possessed a remarkable phagocytic power, but this was diminished by back-pressure. Obstruction was due to many causes, of which the extrinsic were by no means unimportant. Emphasis had been laid on the association between urinary infection and gastro-intestinal dysfunction and infection; the two systems could not be separated, and associated diseases might rise from a single source. Such considerations had led to a tendency towards "medical" treatment—for example the ketogenic diet—and to conservative measures when surgery was necessary. Especially was this true of children. Preventive measures had also reduced urinary complications in pregnancy. Ligation of obstructive vessels, plastic manœuvres, and hemi-nephrectomy were now preferred to nephrectomy. Recent studies based on better knowledge of kidney pathology, operative technique, and diagnosis had led to the recrudescence of nephropexy, which had a definite field of usefulness. Urinary tuberculosis afforded an illustration of the close association between urinary and general conditions; it was much more often bilateral than was generally supposed, and always secondary—usually to a pulmonary lesion. The healthy kidney did not act as a filter to bacilli; every experimental animal with tubercle bacilli in the urine had renal tuberculosis. These lesions might be symptomless and might often heal; many early cases were overlooked, and the cases seen by the urologist were usually advanced, unilateral, and curable only by surgery. Every effort should be made to use all the general hygienic measures available. Genital tuberculosis was frequently present as well.

Calculous formation had also been carefully studied. Deficiency of vitamin A and the ingestion of certain foods seemed to play a part. The precise cause of

stone formation was not yet, however, understood. The urologist had supplied data of constructive value in this subject. The association of infection and lithiasis was being increasingly supported by experimental work. The logical treatment was preventive, but this depended on better knowledge of ætiology. Most ureteral calculi would pass after ureteral manipulations, but it was futile to persist in these if there was associated disease.

Probably the greatest value of urography lay in checking up other methods of diagnosis and the results of operation. It might give unreliable information in reflex anuria and tuberculosis. It had, however, furnished invaluable data in the study of the urinary tract, as had also the chemical tests of renal function. The sulphone-phenol-phthalein test had proved so reliable that it should become increasingly important in the future. The presumption of malignant growth in patients suffering from symptomless hæmaturia, until the contrary was proved, had led to earlier diagnosis of cancer. There was still no unanimity of opinion on the treatment of bladder tumours; good results were claimed by the adherents of resection, radium, and diathermy. The same might be said of prostatic cancer. A routine rectal examination of all men over 50 was an important part of any health investigation. Treatment by radiotherapy had largely supplanted the more radical surgical measures for new growths of the testicles, and in every branch of urinary pathology conservatism was saving kidneys which would formerly have been removed.

The operative relief of prostatic obstruction had been raised to a high level at the beginning of the decade, but further advance had been made by means of local ânæsthesia, better understanding of the underlying processes, and after-care. The development of the prostate was now known to be due to the action of the pituitary on the testis, and prostatic enlargements could be experimentally produced by modifying the endocrine system. The nerve control of the urinary tract had been much studied, especially the sympathetic system, and the results had been applied. Some painful affections had been relieved by nerve section, a measure which had also been suggested for recurrent stone and for reflex anuria. Little could be known in the absolute and all was relative; medical advance, and especially urology, demanded an open mind and a constantly changing attitude. Future progress would be towards prevention, and regular physical examinations of "healthy" people were important. Discomfort was often the first symptom of disease, and a careful search for its cause would go far to prevent the development of serious conditions. Further researches into ætiology and symptomatology were also needed. Victory for the surgeon lay in saving an organ or tissue rather than in its removal.

Mr. SWIFT JOLY, proposing a vote of thanks to Dr. Bugbee, said that the principle of conservatism was the ideal, but required that the patients should be in the ideal condition for conservative surgery. They were usually seen only when the disease was far advanced, and in such cases conservatism was quite out of place. His own tendency, after following up patients for many years, was to become far more radical. Early cases of tuberculosis could rarely be diagnosed and usually cleared up of themselves; these minute lesions were very common in all forms of tuberculosis. Only when the disease became engrafted in the renal pelvis was the clinical picture clear, and by that time conservatism was useless.

Mr. JOHN EVERIDGE seconded the vote of thanks, and spoke of the value of Dr. Bugbee's contributions to urological literature. His warnings about transurethral technique in prostatic surgery should be carefully heeded.

MEDICAL CONFERENCE ON CONTRACEPTION

A CONFERENCE was held under the auspices of the National Birth Control Association and the Birth Control Investigation Committee on July 8th. In the morning Mr. C. W. BELLERBY gave an address on recent researches on temporary hormonic sterilisation, Prof. JULIAN HUXLEY presiding; and Mrs. L. M. JEFFREYS, M.D., Mrs. F. IVENS-KNOWLES, M.S., and Dr. A. G. M. SEVERN spoke on public health authorities and information on contraception, with Dr. HELENA WRIGHT in the chair. Lord HORDER presided at the afternoon session, when Mr. JOHN BAKER, Ph.D., and Mr. H. M. CARLETON, Ph.D., gave a communication on chemical spermicides and their effects. Dr. E. F. GRIFFITH then read a paper on

General Practice and Information on Contraception

For the purposes of this communication Dr. Griffith had ascertained from his first 100 cases how many had attempted to limit their families, and what methods they had adopted before consulting him. Thirty-four had bought some contraceptive appliance or soluble, and six of this group had practised coitus interruptus as well; 52 had practised coitus interruptus only; 6 had recently had their first babies, and were then proposing to use some method; 1 had an imperforate hymen; and 3, although wishing to use some contraceptive device, had not done so because their husbands objected. Only 4 had made no attempt. These figures, though small, indicated that family limitation was established. Further analysis had shown that 41 had had no sexual satisfaction with the method used; 52 were mainly indifferent; and of the remaining 7, 4 had had instruction from Dr. Griffith before marriage. Of those who subsequently received instruction in proper contraceptive methods, 40 stated that the teaching had made "all the difference." Dr. Griffith doubted whether the profession was aware of the extent to which coitus interruptus was practised. It was, of course, the cheapest and easiest method, but its uselessness and harmful effects were generally recognised.

The public were able to obtain information on contraception from some general practitioners, specialists, and clinics, but it was also presented with vast numbers of quack remedies and advertisements which were often quite unreliable. The public was prevailed upon to pay exorbitant prices, and to buy imperfect stock. One type of chemist might suggest some size of cap; appliances were proffered by men who went from door to door; sheaths might be obtained from automatic machines and even garages. In this way the birth control movement had been brought into disrepute. Inefficient advice was also given, doubtless with the best of intentions, by a certain section of midwives; the time had come for midwives to receive some instruction during their training so that they could see that their patients were referred to proper authorities. At the same time it should be explained to them that they would

not lose their practice by encouraging sane birth control. In the course of routine examination of this series of cases, Dr. Griffith had found 22 women to be suffering from some intercurrent gynæcological condition requiring treatment, of which the patient was more or less unaware. He considered that the sale of contraceptives should be prohibited except on the recommendation of a medical practitioner. The advertisement of contraceptives should be prohibited entirely, and only sheaths of a certain standard of reliability should be permitted on the market. He had found some women incapable of carrying out present methods of contraception. Such women, who for medical reasons should not have further pregnancies, should in his view be sterilised, although this presented some difficulties: the moment one confinement was over the woman was in immediate danger of becoming pregnant again. The carelessness and stupidity of some women was amazing. In spite of the most careful teaching they might at times neglect all precautions or use caps with holes in them. Dr. Griffith had fitted the Dutch cap in 51 cases, the Racial in 28, the Dumas in 10, and the sheath in 8. Recently he had been trying two contraceptives: the one, containing hexyl resorcinol, was used by itself and was simpler; the other was a jelly containing saponin and citric acid; they were made by the same firm. Among the 100 cases there had been 28 failures; 9 had been lost sight of, 5 had changed to the sheath method, 1 was utterly unteachable, 7 had not carried out the instructions continuously, and 3 would not take the trouble. One failure was attributed to the faulty fitting of a Dutch cap, and two occurred where a Racial cap was being used.

Knowledge of contraceptive methods did not necessarily mean a declining population. One authority had stated that where less than two years intervened between births the chances of the life of the infant were almost halved in comparison with those born after two years or more. Obviously the survival-rate was the important factor. In Holland, where the knowledge of contraception had been easily obtainable for the past 40 years, the survival-rate had gone up and the population was increasing. The incidence of venereal disease and abortions had decreased, and the marriage age was appreciably younger. Rational birth control had its place in preventive medicine in the same way as antenatal and postnatal work. Improvement of the maternal mortality might be brought about when the debilitated women who crowded the antenatal clinics were prevented from having a superabundance of children. Much improvement in the health of the children might be made if the medical profession would teach birth control and make themselves proficient in its technique. Belief in its benefits should be fostered in the profession by the local medical societies. Those practitioners who undertook to teach their patients should keep careful records of their cases, and should be really competent to fit the different caps. Dr. Griffith gave details of how he conducted his cases. Two rooms in his house were specially fitted up to ensure privacy and to facilitate the work. The patient's name was entered on an index card, and the particulars of the case (without her name) on a separate numbered card, provided by the Birth Control Association. She was then examined in the other room and fitted with a suitable cap; she was taught the technique by a competent midwife who had been specially trained at one of the London clinics. Then she was sent home to practise fitting the cap, to return after a week, or she was given printed detailed instructions, was provided with all requisites and told to return or write when she required more. She was told that she would be asked to return in about ten months and she was reminded when that time came. This system had been taken from the larger clinics. Where, in the course of routine examination, an intercurrent disease was discovered the patient's doctor was notified.

In conclusion, Dr. Griffith urged that the need for birth control was present, and that the medical profession could no longer afford to shut its eyes to the problem.

DISCUSSION

Dr. JOAN MALLESON said that she agreed with almost all that Dr. Griffith had said. She wondered, however, whether he would seriously wish to put the sale of all contraceptives under medical control since such a regulation would put the still unmarried person at a dreadful disadvantage. She considered that practitioners should make an opportunity for their married patients to talk with them on birth control. She was glad to think that thanks to the teaching of the Birth Control Association cases of anxiety neuroses engendered by lack of sexual satisfaction received more sympathetic treatment now than in the past.

Dr. L. C. BUTLER said that in the course of school medical work she had met many mothers who were very eager to discover the address of birth control clinics.

Dr. J. A. DAVIDSON described an occlusive pessary which was slowly soluble. It was made of a glycero-gelatin base with aluminium sulphate and acid sodium sulphate. It had two advantages: it remained effective all night, and it could be sold cheaply.

Dr. KILLICK MILLARD considered that the male sheath was one of the most useful and effective appliances if the technique were taught as well as that of the Dutch cap.

Mrs. EVELYN FULLER said that the Walworth birth control clinic provided printed instructions for the men patients.

Mr. C. I. B. VOGE, Ph.D., attributed the poor results obtained with sheaths to the fact that they were manufactured on an enormous scale, and for the most part were passed untested to the public. Sheaths might be more favourably regarded if they were purchased only from reputable shops. In reply to a question he said that the "Durex" type was made of rubber which had been coagulated by hot water instead of by sulphur.

Mrs. SPRING RICE put forward a plea that those doctors who were in favour of contraceptive teaching should urge the teaching hospitals and post-graduate classes to include the subject in their courses.

Lord HORDER agreed with the previous speaker, saying that he himself was hoping by gradual means to persuade the staff of one large hospital to teach contraceptive technique to the students.

Dr. GRIFFITH, in reply, explained that although he might not wish to keep contraceptive appliances entirely under medical control, he thought it a pity that the public should be able to buy ill-fitting caps from a shop. Public advertisements of appliances should most certainly be forbidden. He had found sheaths unsatisfactory as the poor bought unreliable stock, and most men disliked using the sheath.

REVIEWS AND NOTICES OF BOOKS

Human Values in Psychological Medicine

By C. P. BLACKER, *M.C.*, M.A., M.D., M.R.C.P. London: Oxford University Press. 1933. Pp. 179. 8*s*. 6*d*.

THE concept of value is fundamental to all the normative sciences. In the field of pure biology, value can be regarded simply as the relationship of an organism to its environment measured in terms of adaptation. In the economic sciences value in exchange, as Dr. Blacker points out, can have a fairly strict connotation. In the field of ethics, where supposed absolute standards are under consideration, value, or rather worth, becomes a subject for logical exposition. When, however, human psychology is considered, the concept of value is coloured through and through with relativity.

Dr. Blacker's book is characterised by great breadth of treatment and although he wisely refrains from drawing dogmatic conclusions from material which is always personal and in a state of flux, he has taken great pains to consider the various views that have been held on human values from those of Plato to those embodied in the recent work of W. Urban whose prolixities he has been able to fathom. He shows from his study of psychopathic conditions that the concept of value, while logically definable, has extraordinary diverse manifestations varying not only in mode but in accordance with the mood of a patient and his social and æsthetic background. In a noteworthy chapter on exogenic and psychogenic realities, he argues from biology and psychopathology that it is important to realise the distinction between the private world and the world of mind made by environmental conditions.

The whole work is stimulating if not altogether constructive. Each chapter contains pregnant remarks based upon considerable biological knowledge and a philosophic insight of which Dr. Blacker in his preface too humbly denies the possession. This book should be read by all psychopathologists and by those general physicians who realise the fact that their daily work involves the practice, conscious or unconscious, of psychological medicine. At times this insight brings trouble with regard to fundamental principles; physicians are liable occasionally to feel disturbed when their absolute scale of values appears to be upset or questioned by the ethical neutrality which psychopathology imposes upon its practitioners. This book will help them by defining the issues and thus strengthening the power of detachment which is such an important therapeutic weapon.

Streptococci in Relation to Man in Health and Disease

By ANNA W. WILLIAMS, M.D., First Assistant Director, Bureau of Laboratories, Department of Health, City of New York. London: Baillière, Tindall and Cox. Pp. 260. 29*s*.

Dr. Anna Williams is well known as an experienced and competent bacteriologist who for many years has made a special study of the streptococci. From her vantage point as assistant director in the Bureau of Laboratories, Department of Health, New York, she should be in a position to give a well-informed account of the present position of this difficult subject. That her monograph is somewhat disappointing is perhaps more the fault of the subject than of the author. Much of that which passes for accepted knowledge about the streptococci still rests on an insecure basis. The main effort of the author of a compendious account of this group of bacteria might properly have been directed to the separation of the wheat from the chaff; but Dr. Williams can hardly be said to have faced this task in a determined mood. The question of classification, for example, is handled loosely, and this exposition is not likely to make an obscure subject any more clear. A great volume of experience is now available on the subject of Dick-testing and active immunisation; yet the short account given is neither practical enough to instruct the general medical reader, nor critical enough to appeal to the bacteriologist. The effort to cover the outlying and problematical aspects of the subject has given to some of the section headings somewhat of a "snakes in Ireland" quality. Thus there are sections on the chemotherapy of streptococcal infections, on the streptococci in poliomyelitis, encephalitis, fibrositis, &c. A full chapter is devoted to the rôle of the streptococci in rheumatic fever and allied conditions, which opens a difficult subject but does nothing to clarify it. Important work is here omitted; the book was no doubt published too early to incorporate a reference to A. F. Coburn's most recent and perhaps most telling contribution, but it is difficult to excuse the absence of any mention of the work of W. R. F. Collis and W. Sheldon. The sections on streptococci in relationship to milk-borne epidemics are among the best in the book, and are of especial interest to workers in this country where such epidemics are rare.

British and American opinion on the major problems presented by the streptococci has diverged rather considerably during the last two or three years, and we would have welcomed a more forceful exposition of American views. In short, this monograph seems already a little out of date, and the presence of several misprints, often of an obvious kind, is not calculated to enhance the reader's confidence in the care with which it has been compiled. This is not to say that the work can safely be neglected by anyone who is interested in the streptococci, though it fails to give a satisfactory presentation of this vast subject as a whole.

Therapie in Einzeldarstellungen Bewertung der Ovarialtherapie

By ERNST LAQUEUR, G. A. WAGNER, and R. VON DEN VELDEN. Leipzig: Georg Thieme. 1933. Pp. 108. M.6.

THIS little book on ovarian therapy though of considerable interest is of little practical value. Laqueur gives a short account of the theory of ovarian therapy. He describes the various ovarian hormones and suggests for which gynæcological disorders the ovarian hormones should be used. He does this, however, in a most unusual way, for he attempts to adopt almost a mathematical analysis. For example, he states that the three principles which must be borne in mind are (1) the material available, (2) the diseases, (3) a number of test cases; and he introduces a mathematical formula which is almost a Fourier series to indicate what ovarian therapy should really be. This method of approach, although healthily sceptical, is not likely to appeal to the practitioner. Wagner's article deals solely with the

clinical side and indicates the various forms of gynæcological complaint which are suitable for ovarian therapy. This account is well written and will be read with interest. One of the remarkable features of the book is the absence of enthusiastic recommendation of any of the preparations available. If the purpose of the book was to give practitioners a theoretical basis upon which they could build up their therapy, rather than to give them dogmatically a series of remedies the utility of which might be questioned, the authors have achieved it. But many readers will be unduly discouraged after studying it.

Diagnosis and Treatment of Postural Defects

By Prof. W. M. PHELPS and Prof. R. T. H. KIPHUTH, of Yale University. London: Baillière, Tindall and Cox. 1933. Pp. 180. 23*s*.

IN a period both of controversy and flux in the realm of physical education we welcome this sane book. The subject of posture is at the moment largely occupying the minds of those, both here and in America, who are interested in national physical health. The White House conference paper recently issued by an investigation committee in the States showed the deplorable percentage—80—of postural defects found even in good schools. Recent investigation on a smaller scale here, chiefly undertaken in council schools and institutions, show almost the same high percentage of defects. It is of national importance that this state of affairs should be remedied. The efforts at present directed to this end seem to be ineffectual, since all the children under observation were undergoing some recognised form of physical education. Eliminating for the moment adverse nutritional and environmental conditions, the results, even if better than in the past, seem to be poor. The reason is clear from tests in which classes of children were divided, some doing special postural exercises, and the controls continuing so-called callisthenics—i.e., the normal physical training in the States. They found the former not only improved in posture but in general health, and resistant to epidemics. Similar results are obtained here by Miss M. Forrester-Brown's postural work in the western counties. We are driven to infer that in both countries physical education as taught in the schools does not aim for or achieve the intended result—a good physique as evinced by good posture—or separate so-called "postural exercises" would not be needed.

This book presents clearly and rationally the fundamental facts pertaining to posture. It gives an analysis and diagnosis of normal healthy posture, and it shows the steps of transition from the normal to the abnormal. These facts are known to everyone who has studied the living body. No new ones are presented, but those set out are used logically to suggest appropriate corrective and prophylactic movements which are in turn clearly explained and illustrated. The authors have recapitulated concisely the fundamental meaning of any true educational gymnastic system—that such a system must rest on the foundations of a working knowledge of the living body and, whether educative or remedial, its movements must be based on applied anatomy and physiology and be taught with an eye to form and a sound conception of normal structure and activity. Although, therefore, the book contributes little that is new, and, as a matter of fact, does not in detail justify that part of its title which promises an account of actual treatment of many defects, we welcome it for its sane, clear exposition of principles; for their recognition and application should go far to remedy the relatively poor practical results obtained at present.

Nudism in England

By the Rev. C. E. NORWOOD. London: Noel Douglas. 1933. Pp. 48. 2*s*.

THIS short book puts the case for nudism vigorously and well. Not only with a hygienic purpose is the practice advocated; it is also represented as having psychological value in that it would enable certain manifestations of the sexual instinct to develop more openly and naturally than is possible at present. The author sees, in the opposition to nudism, an expression of that dualism between spirit and matter which in the past has exercised a harmful influence upon religion. "With dualism," writes Mr. Norwood, "naturally went an ascetic practice—for the body, being evil, was to be mortified, and it is not surprising that Christian joyousness was poisoned by an alien asceticism. It is now being realised that this old element of dualism has to be purged from Christian thinking, and it is confidently to be expected that an increasing number will realise that one practical result of this dualism has been the ban on nudity, and that with the repudiation of dualism will go the removal of the prejudice against human nudity." Whether or not this prophesy is correct the student of social tendencies will be interested in reading a good exposition of this one.

A New Approach to Dietetic Therapy

By EUGENE FÖLDES, M.D., formerly Assistant Professor of Medicine, University of Budapest. Boston: Richard G. Badger. 1933. Pp. 434. $5.00.

Dr. Földes has here attempted to apply the rules of physico-chemistry to the phenomena occurring in the animal organism. Many of these phenomena can now be described in terms of diffusion, osmosis, and membrane equilibrium. The chloride content of the tissues and of the blood are thus linked, and Dr. Földes suggests that the excretion of hydrochloric acid into the cavity of the stomach can be described as a physico-chemical process. It may be assumed, accordingly, that a similar equilibrium exists between the blood and intercellular fluid, and between the intercellular and intracellular fluids. The whole organism is thus a single physico-chemical system, and changes in the chemical or physico-chemical composition of a part of this system are followed by changes in the rest. For practical purposes water and minerals are inseparably connected as regards retention and elimination. That there is a retention of water and minerals in certain diseases of the kidneys and of the heart, and in a few other conditions, such as myxœdema, is well known; Dr. Földes suggests that in many other diseases there is an invisible retention. This may take a general form or may manifest itself as a mobilisation and local accumulation of water and minerals previously retained throughout the body.

Retentions may, he holds, develop not only as a consequence of insufficient kidney function, but also as the result of insufficient functioning of the cellular layer which excretes hydrochloric acid. Gastritis may be followed by insufficient elimination

in the same way as nephritis. The frequency of the former makes it of greater significance in water and mineral metabolism than the disordered function of the kidney. Dr. Földes proceeds to develop the argument that retention of minerals and water is an important pathogenetic factor in epilepsy, eclampsia of pregnancy, infantile convulsions, migraine, angina pectoris, bronchial asthma, allergic diseases, gout, hypertension, pernicious anæmia, polycythæmia, acne vulgaris, and a number of other diseases and pathological conditions. There are indeed various constitutions of individuals from the point of view of water and mineral metabolism: (1) those with normal or optimal balance, (2) with retentions either of water or minerals or of both, (3) those with a negative water or mineral balance (demineralisation), and (4) those characterised by an instability of the water-mineral balance, termed a "hirudine" constitution.

After this somewhat lengthy approach, Dr. Földes describes his antiretentional diet, and quotes cases in which benefit and cure have followed its use. A high caloric diet is necessarily rich in carbohydrate or in fat or both, and thus leads to retentions; the diet lowest in calories—i.e., starvation—is said to promote elimination. So the antiretentional diet is one which has 21–28 calories per kg. of ideal bodyweight, calculated by Broca's simple formula of ideal weight in kilogrammes as equal to height in centimetres minus 100. Thus in an adult man of height 175 cm. (69 inches), whose ideal weight is 75 kg., the lowest limit of the quantity of calories administered in the antiretentional diet is approximately 1600 calories (protein 110 g., carbohydrate 190 g., fats 40 g.). The author found no undue loss of weight in his patients, whose weights tended to become stabilised in the neighbourhood of the ideal weight. The relatively high protein content is given purposely to promote the diuresis caused by urea, in which form 90 per cent. of the protein is eliminated. Because of their diuretic effect, nucleo-proteins and purin-containing foods are given in quantity; this may be counter to orthodox teaching of the harmful effect of purin-bodies in gout, but evidence is quoted that a purin-rich diet stimulates the endogenous uric acid elimination. Dr. Földes's diet therefore approaches that which was advocated 30 years ago when the specific dynamic effect of protein feeding was emphasised by Rübner. Not more than a litre of water a day should be taken. No drugs need be used to promote elimination, but Dr. Földes recommends calcium carbonate as a preventive against too much acidity of the gastric juice. In the convulsive disorders, which the author considers due to mobilisation of previously retained water and minerals, luminal should be prescribed, and a theory of its action is discussed which is made to fit in with the general idea of water and mineral retention. Neither the arguments adduced nor the cases cited are convincing.

NEW INVENTIONS

A UROLOGICAL EXAMINATION TABLE

THE table illustrated below has been used by me for some four years and has been found to meet the requirements for which it was designed. These are: (1) That it should be adjustable so as to allow of complete muscular relaxation, thus promoting the patient's comfort and facilitating examination. (2) It should admit of free access to the patient during examination. (3) It should be provided with means to facilitate a clean and easy disposal of urine and antiseptic lotion. (4) It should be capable of rapid adjustment for placing the patient in any required position. (5) Finally, it should be so constructed that all parts are readily taken apart for cleaning and readjusted for use.

The table is built up on a seamless steel frame, and consists of adjustable back-rest, seat, leg-supports for lithotomy position, adjustable heel-supports, and detachable leaf. Its design differs in several respects from the conventional examination couch. The most important improvements are the seat and the freely adjustable leg-supports. The seat is fixed at a convenient angle to give the required forward tilt to the pelvis, and is of such a width that the patient automatically assumes the correct position for examination. The base, which has a deep perineal V-cut in front, is made of cast aluminium, and can be lifted off the frame for cleaning. The seat cushion consists of a rubber-sponge mattress, one inch thick, held in position by a thick moulded rubber cover which overlaps the mattress and the metal base far enough to prevent the accumulation of fluid or dirt between the seat and mattress. The moulded cover can be sterilised by boiling if necessary.

The leg-supports for the lithotomy position are mounted on a ball-and-socket joint, which permits of free movement in every direction. The brackets for the leg-supports also carry extensible heel-supports (not shown in the drawing) which have a fitting midway to receive the leg-supports. The heel-supports are fixed on extensible steel bars, graduated in inches, to facilitate correct adjustment to the required length. When the patient has to remain for a prolonged period in the recumbent position with only the heels supported, the leg-rests adjusted under the knees are a great comfort. The back-rest and the detachable leaf are fitted with sponge-rubber mattresses. An anti-splash tray of good length has been specially

designed to catch any fluid which would otherwise soil the floor.

This table has been made for me by the Genito-Urinary Manufacturing Company of London, and I should like to record my appreciation of their excellent workmanship.

J. ALBAN ANDREWS, *M.C.*, M.B. Edin., F.R.C.S.
London, W.

THE LANCET

LONDON: SATURDAY, JULY 15, 1933

RADIUM BEAM THERAPY

RATHER more than a year ago the Radium Commission decided to disassemble the large single unit of radium entrusted to its care and to make other use of the smaller units into which it was divided. This decision provoked a good deal of public criticism at the time, but the policy of the Commission was endorsed by a conference [1] of leading members of the medical profession, including the presidents of the Royal Colleges and of the Royal Society of Medicine, the chief medical officer of the London County Council, and representatives of the Medical Research Council, the British Medical Association, and the Radium Commission itself. But the conference went on to appoint a technical committee to inquire into the scientific case for mass radiation by radium and to determine the advantages and dangers attaching to the use of such radiation. This technical committee made its final report to the conference in December last.[2] "All the evidence before us," said this technical committee, "goes to show that the use of massive units of even the largest dimensions can be so completely controlled that the safety of the patient is assured. . . . We are satisfied that there is no foundation for the idea that the use of a massive unit is necessarily associated with any special danger to the patient. . . . We are convinced that a large radium unit should be erected in this country, under conditions where such coördinated effort is possible, consisting of not less than 5 grammes of radium element." The conference adopted without hesitation the view of its technical committee that such a unit should be established.

Since this decision was taken very important negotiations have been in progress which matured at a meeting held at the Radium Institute on Tuesday last. A body has been formed, to be known as the Radium Beam Therapy Research, consisting of seven governors of whom the chairman is Sir GOWLAND HOPKINS (representing the Royal Society), the vice-chairmen Lord DAWSON OF PENN and Sir HOLBURT WARING, presidents for the time being of the Royal Colleges; the other members being Mr. WILFRED TROTTER (for the Medical Research Council), Sir GEORGE BLACKER (for the Radium Institute), Lord RUTHERFORD (for the Department of Industrial and Scientific Research), and Prof. A. J. HALL (for the Radium Commission). Largely owing to the good offices of Prof. J. C. M'LENNAN, the Union Minière du Haut Katanga, which has at its disposal a large amount of radium, has agreed to loan 5 grammes of radium element—and later, if necessary, a further 5 grammes—to the Radium Beam Therapy Research on terms similar to those given to the Radium Institute in Paris. This means in effect that no charge will be made for the radium other than that necessary to secure its safe conduct and maintenance. This loaned radium will be located at the Radium Institute in Riding House-street, London, W., which has undertaken to provide the accommodation necessary for its disposal, and to accept patients treated by beam therapy on the same terms as if they were treated in other ways.

The governing body of the Radium Beam Therapy Research has appointed an executive research committee, with Prof. M'LENNAN as chairman, which will include two clinicians, with Mr. GEOFFREY PEARSE (representative of the Union Minière in London) as technical physical expert, and possibly a physicist in addition. Two medical men will be selected to carry out research under the guidance of this committee. The value of beam therapy has already been proved to the satisfaction of the conference in a limited field, and this new development will give the opportunities for the coördinated clinical, physical, and experimental research which are still necessary to show how far these limits can be extended.

[1] THE LANCET, 1932, 1., 1110.
[2] Ibid., 1933, 1., 44.

TWENTY-ONE YEARS OF NATIONAL HEALTH INSURANCE

To meet those responsible for creating, fashioning, and launching the first National Health Insurance Act in the United Kingdom, which came into operation on July 15th, 1912—so runs the invitation—the committee representative of the national organisations associated with the present administration of national health insurance are giving a luncheon on Monday next at which the Minister of Health will speak for the administrators and Mr. LLOYD GEORGE for the creators, the fashioners, and the launchers. When considering the results of a scheme which amounted in effect to a revolution of the conditions under which the working-class population of this country had received medical treatment, a period of 21 years is not, relatively, a very long time. But it is a reasonably adequate period over which to pass in sober review the operation of so far-reaching a national measure of reform. We do not venture to anticipate what Mr. LLOYD GEORGE may say of his child now grown to manhood, without, it may be added, the advantages, or possibly the disadvantages, of too close a parental supervision. But we may expect that, even in an after-luncheon speech, he may moderate his transports of the year 1911. In the closing days of that year, when the first National Health Insurance Commission entered upon its duties at certain hotel premises in Buckingham Gate, Mr. Punch reminded us that the hotel was henceforth under entirely new management, and that special features would be an abundance of "rare and refreshing fruit," 9*d*. of value for every 4*d*. spent, the hotel bus

meeting all trains, and the proprietor meeting all objections.

Now although the National Health Insurance Act in operation has failed to realise many of the picturesque expectations of its founder, it has stood the test of experience surprisingly well. Apart from the fundamental change of transferring to the local health authorities the tuberculosis provisions of the Act (which figured so largely in its early stages) there have been no important changes in essentials during the period of 21 years. On matters of detail, the provisions of the scheme have been necessarily varied from time to time; in one notable instance—the right of the insured person to change his doctor—the variations have been a little bewildering and, at the present time, there is a revival of the demand that the insured person should be able to change his doctor as often as he pleases and at any moment. The principal objection to this is understood to be the rather exaggerated fear that the doctor who writes certificates of incapacity too freely may attract the largest number of patients. The certificate of incapacity is the connecting link between the medical benefit provisions of the Act and those dealing with the principal cash benefits. Every certificate given by a doctor is virtually a cheque on the National Health Insurance Fund. That is one of the reasons why the position of the medical practitioner under the National Health Insurance scheme is by far the most important factor. The primary reason, however, is that it is of the first importance that the employed population of this country, numbering some 15,000,000, should be able to receive, immediately the need arises, medical treatment as a matter of contract and of right. Under the conditions prevailing prior to 1911, a section of the working-class population received medical treatment under the unsatisfactory conditions of the old club practice. A larger section received it either as paupers or not at all. If we pass in review what has been attained—largely as the result of the firm stand taken by the medical profession when the revolution was upon them—we must fairly recognise that, while the employed population have secured medical treatment immediately available under conditions which have for them all the advantages of private practice and something more, the medical practitioner for his part has secured in this branch of his work freedom from financial anxiety and, notwithstanding much in the way of regulation, the preservation of his clinical judgment unfettered, and of the intimate relations which exist between doctor and patient for the most part undisturbed.

In a recent answer to a parliamentary question, the Minister of Health gave figures showing that, from the date of the inception of the National Health Insurance scheme to Dec. 31st, 1932, a total amount of £415,000,000 had been expended on benefits under the scheme. It is a staggering sum and it is difficult for the ordinary person who does not think in millions to understand quite what it means, still less to determine whether so vast an expenditure has been justified in its results. We reflect that the medical service has suffered from the outset through the absence of laboratory facilities, while centres for the organisation of team-work have been lacking, and there has been no provision for consultations, second opinions, and specialist services. The members of the medical profession engaged in the health insurance service have themselves pressed for these from time to time, and the cost relatively to the large sums otherwise involved must be inconsiderable. At least we may express the hope that where so vast a sum has been expended—and other hundreds of millions carried to reserves for meeting future benefits—the question of providing those aids to a general practitioner service which have for so long been absent from the national scheme shall be again considered at an early date.

A PROJECTED ADVANCE IN VETERINARY EDUCATION

MAN'S beasts have always headed the list of his possessions, and agriculture is the oldest of his activities. His own health is conditioned in large part by that of his live-stock. Yet the essential interlocking of human and veterinary medicine has not always been obvious to the leaders of either profession, perhaps because it tends to be obscured when emphasis is laid on the clinical aspects of disease. Among the many services that the late Sir CLIFFORD ALLBUTT rendered to medical science, his consistent and successful advocacy of a closer liaison between the medical and veterinary professions and his insistence that pathology should be treated as a comparative science deserve a prominent place. It is therefore peculiarly fitting that a projected advance in veterinary education, designed to tighten the connecting links already forged, should proceed from the university in which he held for so long the Regius Chair of Physic.

The *Cambridge University Reporter* for May 16th contains the report of a syndicate appointed to consider the organisation of certain research institutes in the University and their relation to the University and its departments. The institutes referred to are those that are attached to the Faculty of Agriculture, and among them is the Institute of Animal Pathology, the director of which already holds a university chair. It is in their review of the work of this Institute that the syndicate have put forward the tentative proposals with which we are immediately concerned. The problem of teaching, they state, has not been an easy one to solve. They are convinced, however, that it is of the greatest importance, both for the success of the Institute itself and in order to increase the flow of recruits well trained in pure science into the veterinary profession, that more should be done in the future than has proved possible in the past. They therefore propose the establishment of a Diploma in Veterinary Science. They suggest that a candidate for this Diploma should pass the First M.B. examination which would, they understand, exempt him from the first examination for the M.R.C.V.S., and that

he should then take at Cambridge certain courses, more particularly in physiology and pathology, which would supply a scientific training and background for his later work in veterinary science, and would incidentally qualify him for the B.A. degree. They contemplate that after this preliminary training the candidate would proceed to a veterinary college and secure his M.R.C.V.S., and that he would finally return to Cambridge for a relatively short course in animal pathology.

The analogy between the course of study proposed and that pursued by those medical students who after completing their preclinical years at Oxford or Cambridge proceed to one of the great London teaching hospitals for their clinical studies is sufficiently obvious. The close association that would ensue between medical and veterinary students during their preclinical years would be to the advantage of both, and would lay the foundation of an intimacy that should render natural and easy their coöperation in later years. That this coöperation will hasten the advance of knowledge, and hence our eventual mastery of disease, there can be no reasonable doubt. Its benefits would probably be most immediately apparent in the field covered by bacteriology, parasitology, and preventive medicine. It is not only that many animal infections are communicable to man or that, in some cases, animals form the main reservoir of infection from which man is constantly at risk. The conditions of veterinary research, and especially the possibility of studying, under adequate control, an infection as it occurs in the natural host, offer advantages that are denied to those who must test their theories by the study of infections as they occur in man. The particular instance of the virus diseases will suggest itself at once to those who have followed the developments of recent years. In the study of dog distemper and of foot-and-mouth disease, medical and veterinary research workers have coöperated with the happiest results. The final conquest of virus infections in man including perhaps the major scourge of influenza will, when it comes, quite certainly owe much to knowledge gained from veterinary sources. The veterinarian cannot advance without free use of the knowledge and technique developed by his medical colleagues. Anything that will tend to increase the freedom and frequency of intellectual intercourse should clearly be welcomed on both sides of an unnatural frontier that should never have existed.

UNEMPLOYMENT AND THE CHILD

THE Minister of Health was able to tell the House of Commons last Friday that in this country there is so far no evidence of any general increase of physical impairment, sickness, or mortality as a result of the economic depression. The public medical services, he said, have proved of inestimable value in these bad times, and he mentioned that last year some 48,000,000 school meals were served by local educational authorities, while 1,000,000 children received supplementary milk. For this statement we may well be thankful; it is clear that much has been done to prevent children from being visited with the misfortunes of their fathers. But Sir HILTON YOUNG would be the first to admit that complacency would be inappropriate in the medical profession while any children suffer from starvation in any degree. Nothing stands out more clearly from the medical teaching of the past decade than the importance of adequate nutrition from the time of conception onwards, and if this teaching has any meaning at all it means that the satisfactory feeding of children should be a first charge on the community.

Is there then any reason to suppose that children are not being properly fed? The views of a sample group of medical officers of health are summarised on p. 152, and reflect the general uncertainty. The problem can be approached in two ways. First it may be asked, is there much malnutrition? The answer is that height and weight measurements reveal on the whole little or no deterioration between 1930 and 1932. Secondly the investigator may inquire what food a householder can buy with the money available. And here it is that the gravest doubts arise; for there is definite evidence that a large proportion of the people of this country are not receiving enough money to purchase the minimum subsistence diets which have been outlined by various authorities.[1] In Sheffield, for instance, where the median rent of a group of working-class houses proved to be 9*s*., the minimum needs standard has proved to be rather higher than unemployment benefit even in the case of small families.[2] Unemployment benefit is sometimes, it is true, supplemented by the public assistance committee, whose relief scale, in Sheffield, is slightly higher; but many poor people still feel that there is a stigma attached to application for public assistance. This is a point brought out in a report entitled Unemployment and the Child[3] just issued by a committee of the Save the Children Fund, which urges that the stigma should be removed so far as possible by the Bill which the Government is likely to introduce in the autumn. The Committee quotes Sir GEORGE NEWMAN'S statement that the proportion of under-nourished children in the schools rose from 9·5 per 1000 in 1925 to 11·2 in 1931, and goes on to say that while the amount of actual deterioration has not so far been great there are an increasing number of cases where there is a serious risk of malnutrition.

In particular families the three factors which may produce suffering among children are (*a*) a rent above 5*s*., which, it is generally considered, can be paid from unemployment benefit; (*b*) a large number of children; and (*c*) children whose ages involve the need for food approximating to the adult scale. Of these factors the one which most often brings unemployed families into the danger zone is high rent, and the Committee

[1] See, for example, THE LANCET, 1933, i., 597.

[2] A Survey of the Standard of Living in Sheffield. By A. D. K. Owen, M.Com. Sheffield Social Survey Committee Survey Pamphlet, No. 9. June, 1933. 1*s*.

[3] Unemployment and the Child. London: Longmans, Green and Co. 1933. Pp. 137. 2*s*. 6*d*.

proposes that, when the Government takes over full responsibility for unemployment, supplementary grants should be made wherever a reasonable rent is causing hardship. An underlying principle should be that supplements of this kind should not make the family better off when unemployed than when at work, and here attention is drawn to the advantage of grants in kind. This applies especially to the second source of danger —large families. In this connexion the Committee attaches great importance to school meals, not only for their actual value to the individual child but also as providing almost the only means by which differentiation can be made between the needs of different types of households. At present, it believes, there are many schools where the children really require extra nourishment, but do not get it because the arrangements are either inadequate or non-existent. Unless there is constant inquiry by the school medical service "there will always be local authorities who will take too low a view of the amount of provision they should make for school meals and milk"; and the Committee hopes that in the new Bill the cost of such meals, in so far as need for them is due to unemployment, will be treated as part of the cost of unemployment which should be borne by the State and not by the local authorities. Approval is also expressed for milk distribution schemes like the one adopted under Dr. A. C. F. TURNER at Rotherham, where malnutrition has been rapidly diminishing under a generous policy. This approval will be general, for it is a painful anomaly that farmers still cannot find a market for their milk although there are schools where children do not receive it regularly.

ANNOTATIONS

BRITISH EMPIRE CANCER CAMPAIGN

THE tenth annual report of the British Empire Cancer Campaign, which is edited by Mr. J. P. Lockhart-Mummery, contains reports from the different cancer research centres and individual workers receiving grants from the Campaign, with a brief introductory summary which appears over the name of Lord Reading. The most important advance is that recorded in Prof. E. L. Kennaway's report on synthetic carcinogenic compounds and on the chemical nature of the cancer-producing compound in coal-tar. This work was recently described by Mr. J. W. Cook, D.Sc., in the special discussion on cancer at the Royal Society.[1] The same applies to the experimental production of fowl sarcomata by the injection of coal-tar and synthetic compounds. This was first reported by Dr. P. R. Peacock working at the Glasgow Royal Cancer Hospital and has been confirmed by Prof. J. McIntosh of the Middlesex Hospital. While the numerous fowl tumours obtained by Dr. Peacock have so far not been found to be transmissible by cell-free filtrates, Prof. McIntosh has succeeded in obtaining at least one filtrable tumour produced by tar. Of other work at the Middlesex Hospital we may mention that of Prof. E. C. Dodds, who has investigated the increased excretion of prolan in the urine of patients suffering from malignant disease of the genital tract. No such increase was found in cases of cancer of other parts of the body. Occasionally an increased excretion of prolan was found even in the complete absence of malignant disease. Mr. F. Dickens, D.Sc., has continued the study of the carbohydrate metabolism of normal and cancer cells. From Leeds Prof. R. D. Passey reports amongst other results that it has been possible to breed a strain of mice possessing an increased susceptibility to tar cancer. Dr. T. H. Lumsden has now begun to treat inoperable cases of human cancer by the injection of the euglobulin fraction of immune sera obtained in sheep by repeated injections of the Jensen rat sarcoma. The serum is injected into the tumour, or into the artery going to the tumour.

A great portion of the report is taken up with an account of the clinical results of radiotherapy in different centres which do not present any special features. There is, however, one line of investigation which calls for special comment, especially as the results are referred to in the introduction as being "rather startling." We read there (p. 18)—

"It has always been stated that the rays of radium and X rays are liable to cause blood changes, such as anæmia, in patients who are being treated by intensive radiation and also in those persons who are handling the apparatus, if great care is not taken to protect them from the effects of the rays upon the blood corpuscles and other constituents of the blood. Recently doubt has been cast upon this view and a very thorough investigation into the variations which occur in the blood counts of X ray and radium workers, patients undergoing treatment, and normal subjects has been carried out by two of the research centres during the year. The results from both agree in substance. It was found that very great variations in the blood count normally occur, not only between different normal individuals, but even in the same individual at different times of the day. The blood counts of normal individuals who had not been exposed to the rays were checked against those who had been subjected to massive doses of radiation. It was found to be impossible to establish any normal standard, and variations in the leucocyte count could not be safely accepted as evidence of damage by rays. . . . The results of the investigations suggest that there are no characteristic changes produced in the blood picture by large doses of radiation. These rather startling conclusions will no doubt call for further investigation on this subject, and should have an important bearing up on radium treatment generally."

The conclusions are indeed startling in view of the extensive observations of Dr. J. Lavedan and of Dr. J. C. Mottram at the Radium Institutes of Paris and London respectively. Their observations seemed to place the sensitivity of the blood-forming organs to radium beyond the possibility of doubt. These workers by no means neglected the factor of individual variations in blood counts and their work has led to the adoption of protective methods which have prevented the serious accidents observed in the early years of radium therapy. The comment quoted above is evidently based on certain observations made under the auspices of the Campaign by Dr. R. H. Simpson, late pathologist to the deep X ray department at St. Bartholomew's Hospital and by Dr. G. White Phillips, working at the Westminster Hospital; it takes no account of the opposite results, more in accordance with previous experience, reported to the Campaign from a third research centre (Manchester and District Radium Institute). Nearly three years ago Sir Humphry

[1] See THE LANCET, June 24th, 1933, p. 1344.

Rolleston drew attention [2] to the conflicting observations on blood changes following irradiation, and the questionnaire issued by the X ray and Protection Committee in June, 1932, was designed to clear up the position. The response, which was due in October last has, we believed, provided but meagre information, but it may be hoped that this will soon be made available. Meanwhile it would be highly regrettable if any protective measures were neglected as a result of publicity given to what appears at present to be inadequate evidence that radium and X rays have no harmful effect on the blood-forming organs.

THE BUCKSTON BROWNE SURGICAL RESEARCH FARM

At the opening of the Buckston Browne Surgical Research Farm at Downe on Wednesday, Sir Holburt Waring, P.R.C.S., delivered a short address in which he laid before his audience a short and frank summary of the present position of surgery. He described the main activities of the College as threefold: to impose examinational tests, to house the Hunterian Museum, and to advance the science and art of surgery, adding that the last responsibility had been placed on the College by trusts, legacies, and gifts under which the provision of accommodation, material, plant, and personnel for experimentation and research became necessary. The history of the Hunterian Museum is a familiar one. It was placed in the charge of the College after its purchase by the State in 1799, and forms the nucleus of the present magnificent collection. Hunter himself conducted the biological experiments associated with the collection in a farm at Earl's Court, a completely rural district at the time, and while the College could house, and has faithfully housed, the specimens and made splendid additions to them, the College buildings have not the necessary accommodation, either in Lincoln's Inn Fields or elsewhere, to follow the great experimenter's example in research work. The situation has long been recognised, and laboratories were started in the Examination Hall, on the Thames Embankment, about 40 years ago. This side of the work of the College lapsed with the change of site of the examination centre. In 1930 Lord Moynihan, then P.R.C.S., voiced the sentiments of certain of his distinguished predecessors and added force to them, by urging that the College should again associate itself directly with surgical research. Accordingly the upper floors of the College building were fitted up and equipped for surgical and biological investigations at considerable cost, but it was soon seen that the accommodation was inadequate for the kind of work that was projected. At this time Sir Buckston Browne came forward and offered to provide, at a total cost of £100,000, a surgical research farm, including a residential hostel, which should follow the ideals of John Hunter and be available for surgical and biological workers. "What a magnificent donation," said Sir Holburt Waring, "in the interests of the advancement of surgery by one of our own profession," as he went on to show that radiological methods and biochemical and biophysical processes are now playing such an increasing rôle in the diagnosis and treatment of disease that the solution of fundamental problems by experimental methods has become the routine of progress. In outlining some of the more pressing surgical and biological investigations which would be carried on at the new centre, he said that recent statistics on the mortality of intestinal obstruction showed about 40 per cent. of patients to die, despite the perfection which surgical technique has apparently reached; that gastric and duodenal ulcers were becoming more common and there was as yet no satisfactory explanation as to their cause or their pathological development; and that the cranial and thoracic cavities, though now in the fields of successful operative intervention, provided many surgical problems. These things he put forward as examples of the conditions for which experimental work should provide explanations. Apart from them the laboratories would afford facilities for those who were undertaking investigation of a purely scientific nature, e.g., into growth phenomena—normal and abnormal—the inter-relationship of certain endocrine glands, and many aspects of neurology. Declaring the Research Farm open, he concluded: "In the association of the surgeon with the biologist we look for the advances of surgery in the future; in dedicating the Farm to the ideals of John Hunter we offer a worthy tribute to his memory; and we wish the workers who make use of its facilities every success in their tasks."

[2] Quart. Jour. Med., 1930–31, xxiv., 101.

THE PHARMACY AND POISONS ACT

Although the Pharmacy and Poisons Act received the Royal assent at the end of June, its effect will be gradual. It is one of those measures with suspended operation, whereof different parts can be brought into force at different times by the press-the-button procedure of Orders in Council. Section 16, which creates the advisory committee known as the Poisons Board, is likely to receive effect forthwith. The Board will then have to sit down to the prolonged and important work of preparing the Poisons List to be submitted to the Home Secretary for confirmation. This may well mean that the bulk of Part II. of the Act cannot operate before next year. The main provisions of the statute have already been summarised in The Lancet when the proposals were in the Bill stage. The domestic reorganisation of the Pharmaceutical Society, the new Poisons List in its two parts, the increased supervision of the sale of poisons, and the more orderly statement of the legal position are advantages which will be increasingly appreciated as time goes by. As usual with modern legislation, much of the new law which most concerns the public—the manufacture, sale, and supply of poisonous substances, the storage, transport, and labelling, the compounding and dispensing, the containers, the ingredients to be added in order to distinguish poisons readily, and so on—are left to be dealt with by the convenient and elastic method of departmental rules instead of being finally settled by the direct decision of Parliament. We hope to draw attention to the salient features of these rules when they at length appear.

ERYTHEMA NODOSUM AND THE EXPECTATION OF LIFE

The many recent studies on the relationship of erythema nodosum to tuberculosis have given a new significance to the former disease in connexion with life assurance. Thus it is becoming more and more desirable to express in figures the shortening, if any, of the expectation of life of persons who have recently had erythema nodosum, and information on this point is to be found in a paper by Dr. H. J. Ustvedt and Dr. A. S. Johannessen in *Norsk Magasin for Laegevidenskaben* for May. Their material consists of 314 patients treated for erythema nodosum in the Ullevaal Hospital in Oslo between Jan. 1st, 1916,

and Nov. 15th, 1932. As large a proportion as 44 per cent. (137 cases) of this material consisted of hospital nurses and ward-maids, and they contributed much to the numerical superiority of the females over the males, of whom there were only 29. But even after the subtraction of the female hospital staff, only 16 per cent. of it was represented by males. The age at which this disease was commonest was between 16 and 25, and the seasons of the year in which most cases cropped up were mid-winter (December and January) and spring (April and May). During the period under review the distribution of these cases from year to year was very irregular without, however, presenting epidemic features. In 288 cases the subsequent careers of the discharged patients were ascertained, and it was found that as many as 44, or 15 per cent., had developed some manifestation of tuberculosis which in 13 cases, or 4 per cent., had proved fatal. When pleurisy was included among the manifestations of tuberculosis, then there were altogether as many as 72, or 25 per cent., of the 288 who developed tuberculosis after the appearance of the erythema nodosum. In 27 cases the tuberculosis developed within a year of the appearance of the erythema nodosum; in the second year there were only 6 cases; in the third year another 6; and in the fourth and fifth years only 2 cases each. Hence, among the 44 patients who developed some other sign of tuberculosis than pleurisy, there were 43 who did so within the first five years, and 27 within the first year. The conclusion which Ustvedt and Johannessen draw from these and other observations are that the subjects of erythema nodosum are more likely to develop tuberculosis, but that this enhanced risk is comparatively small if it does not materialise soon after the appearance of the erythema nodosum.

TONSILLECTOMY AND THE SINGING VOICE

THERE is a special and distinct department of the science and art of laryngology which is concerned with the training and care of the voice, and which is of particular importance to those who make use of the voice professionally either for speaking or for singing. A year ago a society was founded in France, called the Société Française de Phoniatrie,[1] in order to study the physiology of voice-production, to put on a scientific basis the methods of instruction, and to consider the effects on the voice of every kind of bodily disease and dysfunction. The membership, which is not limited to medical men, includes some of the most eminent of French laryngologists, under the presidency of Prof. E.-J. Moure, and we wish it all success.

At the first congress of the society on May 6th Dr. Tarneaud and Dr. Viéla read a paper entitled Tonsillectomy and the Singing Voice. This raises a question of much practical importance, and one about which there have been differences of opinion; but few will quarrel with their conclusions. Where there is nothing more than simple hypertrophy it is often helpful to operate on a patient at the beginning of his vocal studies, but, in the case of a singer already trained, simple hypertrophy without infection is not an indication for operation. On the other hand, chronic tonsillitis produces vocal difficulties and alterations by hindering the play of the velo-palatine muscles and by reflex interference with laryngeal movements. Before deciding on operation, one must be sure that the patient has a good vocal technique, for tonsillectomy cannot improve a bad one. On the surgeon's part an exact operative technique is essential, for good results are only to be obtained if the fibres of the palatine muscles are respected; if this condition be fulfilled, there results from the operation no diminution of timbre but, on the contrary, an amplification of low and medium tones, and sometimes of the high notes. Occasionally the operation is followed by excessive contraction and by diminution of function of the pharyngeal muscles; it is this possibility which makes the laryngologist hesitate in recommending tonsillectomy to professional singers, but the authors assert that the disability is a temporary one which quickly yields to re-education. No doubt the most important factor is the avoidance of injury to the muscle-fibres. Tonsillectomy, then, should not be recommended to a trained singer merely because his tonsils are large; for eminent vocalists have had large tonsils. But it must be advised when a professional singer has chronic tonsillitis sufficient to cause hyperæmia of the pharynx or, still more, of the larynx, or when he suffers from repeated attacks of acute tonsillitis; for the onset of such attacks cannot be foreseen and they are liable to come on at the time of important engagements.

[1] Rev. Française de Phoniat., January, 1933.

THE ROYAL SOCIETY OF MEDICINE: THE LIBRARY

AT the annual general meeting of Fellows, held on July 4th, the report of the Council of the Society was laid before the meeting, and contained evidence of progress and prosperity. The Society numbers 4967 Fellows and Members, of whom over 4000 are Fellows, and it should be pointed out that the country Fellows (1731) and the foreign Fellows (563) now exceed in number the town Fellows. As these figures do not take note of the Corresponding foreign Members, of whom there are over 200, it will be seen that the position of the Society is assured as both a national and an international institution. Another gratifying fact in the main report was contained in the financial statement, which said that the technical value of the Society's House, as given in the accounts, is much below the market value. The report of the honorary librarians gave figures which should be quoted, and those who have any knowledge of the statistics of the use of libraries will find the information interesting reading. The volume of the work undertaken and its variety are striking. The figures run:—

	1923.		1933.
Readers in Library	21,016	.....	44,391
Increase in the number of readers from the previous session	1,005	.... over	8,000
Books borrowed for home use	12,306	.....	28,679
Parcels of books sent	2,500	.....	8,487
Expenditure on books, periodicals, and binding	approx. £2,150		approx. £3,500

In a closer analysis submitted in the report, evidence is given of the hard work excellently directed which has led to these results. The library committee know their gaps, and are making endeavours to fill them. They admit a need for extra copies of standard works as long waiting-lists of applicants are of frequent occurrence. The assistance to literature afforded by the officials of the library steadily grows, and requests for advice in the making of bibliographies and abstracts are increasing. Alongside of this work (and probably because of it) it has been found necessary to extend the catalogue and take note of all pamphlets. The stock-taking implied has led to an examination of an accumulation of duplicate surplus books and periodicals in the basement of the House. A list of these was prepared and copies were distributed to various firms of

booksellers, with the result that a large portion of the collection was sold to four firms for a substantial sum of money. Dr. William Bulloch and Mr. Zachary Cope, the honorary librarians, deserve warm congratulation.

GERMAN DOCTORS AND SOUTH AFRICA

THE regulations which enable doctors who hold recognised medical qualifications in countries, between which and Great Britain no reciprocity exists, to obtain a British qualification after a year or two's study and the passing of the final examination are causing uneasiness in South Africa. A joint committee composed of the parliamentary committee of the Cape Western Branch of the South African Medical Association (British Medical Association) and local members of the federal council of the Association have drawn up a memorandum on the subject which represents their unanimous opinion. While disclaiming any religious or racial bias, the committee contend that the registration of nationals of a country such as Germany not granting reciprocity to South Africans is an evasion of the spirit of the Medical, Dental, and Pharmacy Act, and that since South Africa now possesses medical schools, established and maintained at considerable expense to the country, the opportunities of their graduates should not be prejudiced by "an excessive and exceptional influx of foreign practitioners." The *South African Medical Journal* (June 10th, p. 374) reports that a deputation led by the president of the federal council, Dr. T. Lindsay Sandes, laid these views before Mr. J. H. Hofmeyr, Minister of Health, on June 5th, Sir Edward Thornton, Secretary for Public Health, being present. Mr. Hofmeyr, while holding that the introduction into South Africa of a number of highly trained medical men might be to the advantage of the community, apparently suggested the possibility of dealing with the situation by regulation under the powers conferred upon the South African Medical Council. A memorandum is being drafted for submission to this Council.

RURAL WATER-SUPPLIES

OCCASIONAL epidemics in rural districts draw attention to one of the weakest features of our health system or rather to a region untouched by system—the water-supply of villages and small towns. Two papers read at Blackpool before the British Waterworks Association recently dealt with this rather difficult subject, mainly in relation to the north of England, but conditions all over the country seem much the same. Mr. T. Marsland pointed out that by many it is not fully realised that a proper water-supply is as important in rural districts as in towns, especially since rural areas are the source of supply of most foodstuffs, particularly milk. Many villages and isolated houses or groups of houses depend upon wells usually collecting surface water of very doubtful quality. Others may have a communal supply either piped to the houses or to public stand taps, or may be able to tap the mains of a large undertaking whose pipe system passes near. For those places which have not yet a satisfactory supply the problem is often very difficult. If they buy water from a large undertaking and distribute it, a continuing cost is involved which, unlike the case of a supply of their own, will never be paid off and become profitable. If they elect to have a public supply of their own, the possible sources are fast becoming earmarked by larger concerns and, apart from the fact that most of our rivers seem to be polluted, the legal difficulties concerning water flowing in definite courses are considerable. Percolating underground water seems mostly to be the easiest available source, but if this needs treatment difficulties at once arise. A small community cannot usually afford a whole-time man of sufficient ability to look after anything but the simplest pumping and distributing appliances, and the solution seems to be the surrender of local pride and the combination of several villages to obtain a good and sufficient supply for present and, as far as can be foreseen, future needs. This implies taking expert advice on source and layout and some expert check on the continued satisfactoriness of the supply. In scattered districts the great length of pipe lines relative to the number of consumers would probably prevent such a scheme being adopted.

Mr. Edgar Morton's paper was written mainly from the point of view of a geologist who has studied water-supply. His purpose was to demonstrate that successful coöperation by rural authorities involves as a primary factor a local hydro-geological survey of the water resources of rural areas. He had no difficulty in establishing the case for such a survey which has too often been dispensed with, to the detriment of ratepayers in both large and small communities.

RADIOTHERAPY AT UNIVERSITY COLLEGE HOSPITAL

University College Hospital published last year the first report of its radiological registrar, Dr. R. Pilcher, providing a useful summary of the cases treated, the methods used, and the results. For cancer of the breast, operation is preferred but is combined with radiotherapy in borderline cases; X rays and radium are used where operation is contra-indicated, for local recurrence and for metastases. Cancer of the cervix is treated by a combination of radium and X rays, but cancer of the body of the uterus by operation wherever possible. Interstitial radiation and/or X rays are used for the upper part of the respiratory and alimentary tracts, and X rays are also used for leukæmia, toxic goitre, tuberculous glands, and sometimes for menorrhagia, although for this the great majority of patients receive radium treatment. In the second report,[1] for 1932, which has now appeared, is included a report from the radium registrar, Dr. Gwenda Hilton, who was appointed during 1931. Work is being continued along the same lines as last year, except that the intensive split dose is being increasingly used. More care, also, is taken in protecting the irradiated skin; vaseline is applied regularly and no washing with soap is permitted for some time after exposure. The amount of radiation reaching the growth has been carefully estimated in a great number of cases. The treatment of menorrhagia suggests that there is a relation between the age of the subject and the dose required to produce amenorrhœa. The immediate results of treatment of cancer of the larynx and pharynx have considerably improved since the introduction of the intensive split-dose method. Interesting results have also been obtained by the application of this method to cancer of the cervix, the whole treatment being spaced out over 16 days and the total dosage increased by 23 per cent. The treatment of glandular metastases by radium has been carefully analysed in cases where the primary tumour had been successfully treated. The results show that the treatment of the glands is by no means

[1] Report on Radiotherapy for 1932. By Gwenda Hilton and Robin Pilcher. John Bale, Sons and Danielsson. 1932. Pp. 82.

hopeless, even in advanced cases of this kind, and suggest that the degree of involvement of the glands may have some relation to the response of the primary tumour to irradiation. A contribution to this report by the ophthalmic registrar on the results of radium application to the eye was noticed in THE LANCET on July 8th (p. 87). A one-gramme radium bomb has been in use since August, 1932, for malignant disease of the mouth, throat, and breast, and for glandular metastases. The maximum exposure given in 24 hours has been 16½ hours, and the duration of each exposure two hours, given if possible twice a day for from one to three weeks. Most of the patients have tolerated this treatment well and it is suggested that the gramme-unit will prove a valuable addition to therapeutic methods, especially for large tumours of the neck.

THE NEWCASTLE COLLEGE OF MEDICINE

THE report of Sir Amherst Selby Bigge to Lord Londonderry, Chancellor of Durham University, upon the administration of the affairs of the Newcastle College of Medicine has been received by the College authorities. The report finds the accusations of maladministration against the Council of the College unsubstantiated, and with regard to the treatment of Prof. H. J. Hutchens Sir Amherst says: "In my own opinion the allegation of mala fides is not established . . . The Council's act was not to remove him as professor but to terminate his engagement as lecturer in the College leaving him in possession of the post of Heath professor in the University." He found the articles of the constitution of the College defective both in substance and in drafting, and so conducing to the recent difficulties: this is a matter, he said, demanding careful consideration.

CANCER OF THE BLADDER

IF the ureters can be satisfactorily transplanted into the bowel, cystectomy offers an excellent chance to the patient suffering from vesical carcinoma. The disease is usually local and metastases are late. The big difficulty is always the same—the provision of an alternative route for the urine—and it is this aspect of the problem that Dr. R. C. Coffey has been studying for many years. The methods of ureteral transplantation he has followed are three in number.[1] In the first the ureter is drawn into the interlamellar space outside the intestinal mucosa and its split end is dragged through an opening made in the mucosa at the caudal end of the intestinal incision. The second plan is to fasten a fine tube inside the ureter so as to seal it against intestinal infection. This again is then passed through an opening in the mucosa at the caudal end of the intestinal incision. Thirdly, the ureter may be brought into the interlamellar space by an anchor stitch which fastens its end in the angle of the caudal end of an incomplete intestinal incision. The anastomosis is gradually made by a tightly tied suture which transfixes both the ureter and intestinal mucosa and is complete two to four days after operation. Of these three techniques, the second and third are preferable for cases of vesical carcinoma. The third, though the simplest, has the disadvantage that it involves two operations, the two ureters being transplanted at separate sessions. The second is probably the best, because the ureters are transplanted at one operation, but it requires more skill and experience than the third. Coffey gives the results of 11 cases of cystectomy for cancer of the bladder, with an immediate mortality-rate of 27 per cent. Seven of the eleven patients were cured in so far as there is no evidence of recurrence at periods ranging from one to four years after operation. Apart from being well and comfortable, they are unusually happy and well satisfied with the results, in marked contrast to those afflicted with carcinoma of the rectum who are often more or less suicidal because of the inconvenience of a colostomy opening. The results compare favourably with those obtained in the treatment of cancer in any other part of the body, and Dr. Coffey is to be congratulated on the part he has played in improving the lot of sufferers from what was at one time regarded as a hopeless condition.

[1] Amer. Jour. Surg., May, 1933, p. 254.

HEART DISEASE IN SCARLET FEVER

THE ætiology of the cardiac lesions which complicate or follow scarlet fever is still uncertain. The lesions are similar to those of rheumatic fever, and some think that the chronic valvular disease which seems to result from scarlet fever is really caused by rheumatism. J. Wickstrom[1] reports an electrocardiographic study of 100 cases of scarlet fever, in which serial records were taken. A total of 2669 tracings were analysed and many abnormalities were found in the curves, making their appearance between the second and fifth weeks of the disease. The chief findings were lengthened P-R interval (67 per cent.), lengthened Q R S complex (25 per cent.), and alterations in the configuration of Q R S (14 per cent.), and the waves were generally increased in size. Changes in the T-wave were also observed, most often affecting the third lead; in the initial phase of the disease, T in lead I. was sometimes negative, and in the later stages opposing changes in T and T_3 were occasionally seen. The onset of these changes was not accompanied by alterations in the general condition of the patient nor were they apparently related to other complications. Their incidence was not affected by serum treatment nor by previous active immunisation. In a considerable proportion of cases the disturbances of conduction revealed in electrocardiograms were found to persist on an average seven and a half months after the fever. These facts are interesting, but they still leave doubt whether scarlet fever can produce a chronic cardiac lesion without the intervention of rheumatic fever. The histological picture produced by the latter is considered to be specific, and this being so, a pathological study appears to be required for answering the question.

THE opening ceremony in connexion with the third International Pædiatric Congress will take place on Thursday next, July 20th, at 10 A.M., at the B.M.A. House, Tavistock-square, W.C. The Duke of York, who will be accompanied by the Duchess, will receive the assembly in the Great Hall of the B.M.A. House, and it is requested that members of the Congress will be in their places a few minutes before 10 A.M.

WE publish elsewhere a letter, importantly signed, asking support for a fund to establish a memorial to the late Dr. Carey Coombs, whose strenuous work as a cardiologist is known to all. It is suggested that the memorial should take the form of a research studentship at the University of Bristol, and the proposal is an entirely suitable one, which we hope will appeal to many who knew Dr. Coombs's ardent interest in his work.

[1] Acta Pædiatrica, 1933, xiv., Suppl. IV.

POST-GRADUATE LECTURES

We print below two more summaries of lectures delivered during the week-end post-graduate course held at St. Bartholomew's Hospital on June 23rd and 24th.

THE TREATMENT OF SPASMODIC DYSMENORRHŒA

(Dr. Wilfred Shaw)

The ætiology of dysmenorrhœa is not fully understood. Clinically it is known that the uterus is ill-developed in most of the cases; often it is of the small adult type, sometimes it is acutely anteflexed. Not uncommonly the cervix is long and conical, and the external os is small. Severe cases of dysmenorrhœa are also met with when malformations of the uterus are present. In a large number of cases of dysmenorrhœa the pain starts at puberty, but this history is not by any means invariable, and commonly menstruation is painless until about the age of 19, when severe dysmenorrhœa develops. Mostly the pain does not conform to the typical spasmodic dysmenorrhœa of the text-book. The abdominal pain usually lasts throughout the period, but in addition, on the first day of the period a short spell of excruciating pain may completely incapacitate the patient. Sometimes the severe pain is premenstrual in type, arising during the day before the period begins. In such cases the dysmenorrhœa may be regarded as congestive according to the classical description of text-books, but probably the underlying cause is the same.

Two types of pain have thus to be considered: (1) the abdominal discomfort which persists throughout the period, and is usually not severe enough to warrant drastic treatment; and (2) the acute pain which causes great distress and is responsible for much incapacitation amongst girls of the working classes. This severe pain is almost certainly due to a painful spasm of the uterus. Dilatation of the cervix has been employed fairly extensively without anæsthesia for such investigations as insufflation of the Fallopian tubes and lipiodol injections. Experience has shown that patients frequently complain of severe pain similar to that of spasmodic dysmenorrhœa when the internal os is being dilated. It seems likely, therefore, that the severe pain of spasmodic dysmenorrhœa is to be attributed partly to the contraction of the uterus and partly to the stretching of the internal os.

The diagnosis of spasmodic dysmenorrhœa is made without difficulty. In patients between the ages of 30 and 40 such conditions as chocolate cysts of the ovaries and of submucous fibroids must first be excluded. It should be remembered that it is rare for patients over 35 to complain of severe spasmodic dysmenorrhœa; not only is it almost invariably cured by childbirth, but even in nulliparous women there is a tendency towards spontaneous improvement after the age of 35.

Treatment varies with the age of the patient. In young girls operative treatment should be avoided if possible. Attention should be paid to the general health; iron and aloes have long been popular remedies. Cases occur in girls who work in shops, offices, and factories, and these should be instructed to get as much fresh air as possible and to play games; for schoolgirls exercises and gymnastics are essential. It is wrong, however, to be optimistic about the results of general treatment alone. Of special measures perhaps the best is to inject atropine when the severe pain develops, when relief is immediate; but by the time the doctor arrives to give an injection the worst of the pain is over. Unfortunately belladonna is not of much, if indeed it is of any, value. The most popular and widely used remedy is aspirin, and this is better combined with phenacetin and caffein. Veramon in doses of grs. 9 is efficacious when first tried, but, as with all drugs of this kind, similar good results are not always obtained when the same remedy is used for further attacks of pain. Other popular remedies are hot baths, and some women take alcohol either in the form of whisky or of gin; but these methods are only helpful with mild cases. Some years ago I started using œstrin in cases of spasmodic dysmenorrhœa, and found that good results were sometimes obtained. The basis of the treatment is that this hormone produces hypertrophy of the uterus. At the present time I use this treatment fairly extensively. On the three days before the period is due I give injections of œstrin in the form of one or other of the proprietary preparations—oestroform, progynon, menformon, or theelin. I find this method of treatment to be better than administration of the pituitary hormone.

Operative measures.—None of these methods can be regarded as a certain and reliable cure for cases of spasmodic dysmenorrhœa in young girls. On the other hand, as has been said, operative interference is to be avoided if possible, for the physiological cure is childbirth. In some cases, however, the incapacity of the patient is so complete that more drastic measures must be adopted, and of these the simplest is dilatation of the cervix. In my experience dilatation cures about 25 per cent. of the patients; 50 per cent. are improved for a few months; while the remaining 25 per cent. show no improvement. Dilatation of the cervix is not always a simple procedure if the uterus is ill-developed. It should be slow and should be carried at least as far as the insertion of a No. 14 dilator. Usually one can feel the constricting fibres in the region of the internal os tear through during the passage of a No. 11 dilator. A glass rod should be left in the cervical canal for two days after the operation. If patients over 25 are not cured by dilatation of the cervix further surgical interference is justified. At the present day the treatment of choice is presacral sympathectomy. This operation has been very extensively performed by Cotte in France and by Malcolm Donaldson in this country. The operation is easy to perform. It consists in incising the peritoneum over the promontory of the sacrum and then dissecting clear the large vessels below the bifurcation of the aorta and removing the tissue in the space between these vessels, the peritoneum, and the presacral fascia. Although the operation appears to be severe it is not intricate, and the mortality is very small indeed. The results are amazingly good; so far as my own experience goes, almost all patients can be regarded as cured after the operation. There are no after-effects, and Cotte has recorded a fair number of patients who subsequently conceived and were normally delivered.

PAINFUL FEET

(MR. S. L. HIGGS)

OF all minor maladies a painful foot is one of the most disabling and depressing. The public is not, as a rule, well advised on this subject. In the past teaching in the medical schools on "foot troubles" has been very deficient and many doctors feel that it is rather outside their province. Other advice is therefore sought. The chiropodist, however skilled, can afford but temporary relief. He treats the corn but not the cause of it. The special shops devoted to foot comfort appliances frequently fail to give relief, judging from the number of patients who come to hospital seeking further advice although laden with their wares. If the bonesetter is consulted he usually discovers some "bones out of place" which he "puts back" by manipulation. Manipulation may be the right treatment if the pain is due to adhesions but, since accurate diagnosis and after-treatment are lacking, most patients are no better although they remain convinced that something beneficial has been done.

The normal foot has strength and flexibility. It must be emphasised that the muscles and not the ligaments form the natural support of the arches. If the muscles fail the weight falls on the ligaments which become stretched and painful. Adhesions and stiffness develop and the flexibility disappears. There is no merit in a high arch unless it is supple and under muscle control. In childhood pain in the foot is a serious symptom, since a child under 10 years old practically never suffers from foot strain and the pain may be due to tuberculosis of the tarsal bones or to some unusual condition such as Köhler's disease. An X ray examination is therefore essential.

DISORDERS OF THE LONGITUDINAL ARCH

Disorders of the longitudinal arch, a common cause of painful feet, can be divided into three groups. The first, occurring in adolescence, is due to *overstrain of apparently satisfactory arches*. A typical case is that of the boy who has just left school and become a messenger. He is on his feet far too much and after a time acute pain develops. The foot becomes stiff, everted into the valgus position, and there is spasm of the peroneal muscles. Rest is an essential in treatment. The boy must stop work. Manipulation of the feet is carried out under an anæsthetic followed by a period of rest in plaster. During this time the boots are wedged on the inner sides and fitted with outside irons and ankle-straps. Removal of the plaster is followed by physical treatment and a gradual return to activity. A focus of infection must be sought as the condition may be complicated by arthritis of the tarsal joints.

In the second group is the *common foot strain* which occurs among adults. There are two types: (1) an acute condition, in which there is marked œdema and the spring ligaments are painful; and (2) a chronic condition. Treatment for acute foot strain is by rest, support, gentle massage, and re-education in walking. In such a case a rigid metal support is very harmful. If any "support" is necessary one made from a plaster cast of the foot is best and its chief function is to deflect weight to the outer side. It is made of cork and leather, is light, and fits snugly under the sole of the foot. In addition, wedges are fitted to the heels of the shoes. In the chronic condition the symptoms are an aching pain in the feet and cramp up the calves of the legs. Flexibility of the foot has been lost, movement is restricted, and attempts at flattening the arch hurt. Treatment is by manipulation under gas. The foot is put through the full range of plantar flexion, dorsiflexion, and inversion. Adhesions are broken down and the painful ligaments stretched. In many cases the pain disappears immediately mobility is restored. Instruction in exercises and correct methods of walking and standing are then given and the shoes are altered if necessary.

The third group includes the thorough-going *broken-down flat-foot*, in which the arch touches the ground throughout its length. Such a foot is not in itself painful but the onset of rheumatism or arthritis causes symptoms. Any attempt to restore the arches is useless, but the foot can be made more comfortable by suitable shoes.

DISORDERS OF THE TRANSVERSE ARCH

Transverse arch troubles are more common in women than in men. The complaint may be of a bruised feeling, like walking on pebbles, under the balls of the feet, or of a severe acute pain which occurs suddenly when walking and is due to nerve pressure. Short stockings which constrict the toes and shoes of a bad shape with too high heels are the chief factors which cause this troublesome condition. Treatment is by a support, made from a plaster cast, to take weight off the painful joints. If the toes are clawed and stiff, manipulation under gas followed by re-education of the intrinsic muscles and faradic foot baths will also be required. As a temporary measure strapping the fore part of the foot or a metatarsal bar gives relief.

DISORDERS OF THE TOES AND HEEL

Hallux valgus is a common trouble among women. It is often associated with a flat transverse arch and is due to similar causes. The site of pain varies. It may be in an inflamed bursa overlying the prominent joint, in the big toe-joint itself, or in the other metatarso-phalangeal joints which are taking too much weight. In selected cases operative treatment gives excellent results. The modern method is to resect about two-thirds of the metatarsal head, preserving the bearing surface for the sesamoid bones. The bone is made absolutely smooth with a file and nothing is interposed between the joint surfaces. Careful after-treatment by massage and exercises is essential. An operation for removal of the bursæ and exostoses only is unsatisfactory as the valgus deformity is not corrected and the trouble will recur.

Another painful condition is a stiff big toe-joint—*hallux rigidus*. It often occurs in adolescence and trauma is a factor in producing it. It may follow a sudden injury, such as a stubbed toe, or be due to chronic strain through wearing short shoes and stockings. Usually an infective focus, such as septic tonsils, is also present. A traumatic arthritis is thereby set up. In the early stages rest and alteration to the shoe to support the inflamed joint are indicated. In the later stages, where typical osteo-arthritic changes have occurred and the joint is very painful, good results may be expected from operative treatment. Removal of the metatarsal head may be disappointing through the development of arthritis in the new joint. A safer plan is to remove the exostoses from the head of the metatarsal and excise the proximal half of the first phalanx.

A *hammer toe* gives rise to pain because of shoe pressure on the painful joint. Pain may also develop under the ball of the foot due to downward pressure of the corresponding metatarsal head. The deformity occurs because the toe is over long and is pressed into line with the others by the sock or stocking.

Once it is developed, the only treatment is operative. The toe should not be amputated. The usual operation of excision of the flexed interphalangeal joint may lead to a painful fibrous ankylosis. A better plan is to spike one bone into the other. This is done by cutting the proximal phalanx into a point and fixing this into a hole bored in the base of the second. Firm internal splinting is secured and the patient can walk without pain in a few days.

A *painful heel* is a common complaint, especially in middle age. There is often a history of lumbago or sciatica. It is due to plantar fibrositis and the tender spot is at the attachment of the plantar fascia to the os calcis. A spur may be present, but since this is secondary and is not the cause of the symptoms it rarely requires removal. Dental sepsis is often responsible and should be treated. A soft sponge rubber heel pad should be fitted inside the shoe. Soda foot baths or diathermy will usually help to relieve pain.

SPECIAL ARTICLES

THE ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION

THE annual meeting of this association took place on July 5th, 6th, and 7th, at Colchester and Clacton-on-Sea, under the presidency of Dr. F. DOUGLAS TURNER. The meetings at Colchester were held at the Albert Hall and at the Royal Institution for Mental Defectives, while a visit also took place to the Severalls Mental Hospital, at the invitation of Dr. R. C. Turnbull.

The Gaskell prize and gold medal were awarded to Dr. Desmond Curran, and the special merit of Dr. L. Minsky's essay was recognised by a gold medal. The bronze medal was awarded to Dr. D. N. Parfitt, and the prize dissertation was that of Dr. J. S. Sharp.

The PRESIDENT gave an address on

Mental Deficiency

He said that to France belonged the honour of first attempting to do something for the mentally defective. Seguin founded in Paris the first school for educating idiots in 1837, with the primary object of overcoming muscular incapacities, and this formed the basic principle of the training in occupation centres to-day. The first need was to awaken the senses, educate the larger muscles of the body, and infuse vitality. The teaching to read and write as a preliminary step had been abandoned. Dr. Turner dealt at length with the history of the movement in this country. Though the institution over which he presided had now an endowment fund of £50,000, and 400 acres of land, not a single bed nor a portion of a building had been provided by any local or statutory authority; this work was the result of charitable funds. An extension had now been planned for the accommodation of a further 444 patients. It was not until 1914 that, under the Mental Deficiency Act, the term "feeble-minded" was legalised to cover the highest grades of defect. Only after long years of experience and care did early workers conclude that though great improvement was possible in these defectives, for large numbers of them life-long care of some kind was a necessity. The institution of intelligence tests gave the impression that mental deficiency was much more widespread than was actually the case, and the feeling of alarm was increased by emphasis on eugenics and heredity studies. Less than ten years ago a well-known society which was established to improve the race stated in a pamphlet: "If all mental defectives could be prevented from having children the number of defectives in the country would be halved in about three generations." To those with daily experience with defectives that was a statement which had no warrant in present knowledge. Dr. Turner's view was that there had been no great increase in the number of defectives, but there might have been a slight increase partly due to a lowered infant mortality and partly to the greater longevity of defectives; but he did not consider that, on the average, defectives were more prolific than were normal people of the same social standing, or that the children of such people were necessarily, or even often, defective. Popular opinion was that deficiency was a single entity or disease, whereas it was a dozen or more separate things with different causes, and therefore different remedies.

THE EFFECT OF ENVIRONMENT

Dr. Turner had been greatly struck by the great effect of environment on the production of certified defectives. The legal definitions of a defective were social in character; they did not depend on mental age or specific tests, nor on educational capacity, but on the social capacity to live in the world to which they belonged. It was a truism to say that civilisation produced defectives by making living conditions more difficult; thus a person regarded as defective in a large city would pass muster as normal in an agricultural area. Many of these people adjudged defective were free from disease or discoverable abnormality; they were merely somewhat short of a high standard, and this did not justify their being classed as diseased. The great hope for the future in this domain lay in attacking the environment. More than 10 per cent. of the patients on the books were out on licence. But all new patients must be at the central institution for a time, especially for skilled examination and care. These institutions should always be centres of research, also training schools, but he did not think the medical superintendent should act as adviser to the local authority. The institution should turn its back on the alarmist views prevailing in some quarters, return to the wider outlook of our forefathers, and concentrate on stabilising the defective and leading him back to the world from which he came.

Among the papers contributed and discussed was one by Dr. R. M. STEWART (Leavesden Mental Hospital) on

Juvenile Types of General Paralysis

He said that the mental symptoms in this condition were imposed on a mind which had shown an imperfect development from the earliest years of life. Since Clouston's original description in 1877, 600 cases had been recorded. Often the symptoms were quite unlike those seen in the adult form. Owing to the increasing tendency of general and neurological hospitals to undertake treatment of all forms of neurosyphilis, figures concerning the disease were apt to be misleading. In a recent survey of 50 cases of congenital neurosyphilis attending the National Hospital in the last ten years, 32 per cent. were found to be examples of juvenile general paralysis, and

12 per cent. of juvenile tabo-paresis. About 1 per cent. of all cases of congenital syphilis developed general paralysis. The development of symptoms being so insidious, it was impossible to fix the date of onset; moreover, if there were early focal signs it might seem to be a case of involvement of the covering and supporting tissues of the brain rather than of the parenchymatous elements. In this juvenile form the sexes suffered about equally, and it was not uncommon for the disease to last ten years or even longer. The early appearance of epileptic convulsions must be regarded as an unfavourable sign. These patients did not commonly show the syphilitic facies. Endocrine disturbance with infantile sexual development was common, and puny physical development was usual. In a general way the neurological signs resembled those of the adult paretic. Foremost among the motor signs were pupillary changes, including optic atrophy, though the Argyll Robertson pupil was less common in the juvenile than in the adult type. One of the earliest motor signs was ataxia and a clumsy gait.

As to mental symptoms, a progressive and profound dementia removed what little intelligence might have existed. Among predisposing causes was trauma to the head following a fall. The incidence of neurosyphilis in an unselected group of syphilitics was 25 to 35 per cent.; therefore the fact of a juvenile general paralytic having a paretic father or mother might be no more than coincidence. In many congenital syphilitics the cerebro-spinal fluid was serologically and cytologically normal soon after birth but this did not preclude the presence of spirochætes in the fluid. It remained for future research to determine whether these cases were foredoomed to develop general paralysis after the lapse of some years. Dr. Stewart had often searched for nests of spirochætes in the vesical organs of congenital syphilitics—i.e., those dying in adolescence—and of general paralytics, but had never found them.

With regard to pathology, certain features were characteristic of the juvenile type, the chief being a smallness of the cerebral hemispheres, and, of next importance, an atrophy of the folia of the cerebellum, with a gliosis far beyond anything seen in any other parts of the nervous system. There was also a great reduction of the molecular and granular layers, and a disappearance of the Purkinjé cells. The other organs of the body might show changes of a syphilitic character; the liver might present some degree of chronic interstitial hepatitis, while chronic inflammatory changes were common in the pancreas and the ductless glands, and in the larger arteries there might be evidence of atheroma.

Little of a hopeful nature could be said about treatment. The most which could be hoped for was some prolongation of life. Dr. D. Nabarro, however, had treated a girl, 6 years of age, by inducing malaria and by intracisternal injections of salvarsanised serum, and the improvement was so pronounced that it was hoped she would prove educable and would grow up to healthy womanhood. But where feebleness of mind existed from birth, the neuronic development would have been checked in early life, and antisyphilitic measures would reach their objective too late.

Prof. LANCELOT HOGBEN read a paper entitled

The Interaction of Heredity and Environment

Speaking as a biologist, he remarked that in the world of science it was generally found that virile opinions were those which were fortified with a rather effeminate equipment of evidence. One of the subjects of which this was true was mental inheritance. In early days it was simple and attractive to place the blame on heredity. It was now becoming apparent that preventive policies based on genetic principles divorced from exact scientific knowledge of human inheritance were no more likely to succeed than curative efforts unfortified by a scientific understanding of the environment. From the biological standpoint it was not a problem of genetics alone; it demanded all that the geneticist could contribute to the recognition of how the characteristics of an organism were influenced by those of its ancestors; it called for all that the nerve physiologist could impart as to how the characteristics of an organism were influenced by the changing pattern of stimuli to which it was subject. The advance of science depended as much on learning the technique of asking questions in the right way as upon inventing devices for solving them. It has taken a long time to outgrow the confusion between legal inheritance and biological inheritance; it was still believed that people hand on their noses in the same way as they hand on their bank balances. It was now possible to define what was meant by differences due to genes and differences due to environment. Seeing that behaviour had its material basis in the structure of the nervous system, it would be surprising if it were not found that genetic differences played some part in determining individual differences of social behaviour. This was shown in the work of Dr. Lionel Penrose (Colchester) on the interaction of heredity and environment, with special reference to Mongolian idiocy. That work indicated that a fuller understanding of the genetic aspect of mental diseases did not always lead to the conclusion that selection was the most effective way of eliminating them. The effectiveness of selection depended on the kind of transmission involved, and more knowledge of the part played by the uterine environment in determining mental defect could help in unravelling the way in which gene differences associated with mental defect were transmitted.

Dr. A. G. DUNCAN (Severalls Mental Hospital, Colchester) read a paper on

Cholesterol: its Relation to Mental Disorder

referring to work which had been carried out at his hospital since 1926. Cholesterol, he said, was a constituent of all animal cells in free and combined forms; similar sterols were present in all vegetable cells. In the blood it was distributed about equally between the erythrocytes and the plasma. Most of the researches in cholesterol in relation to mental disorders was carried out by observing changes in the blood-cholesterol. Not much work had been done on this, and the conclusions drawn from it were very inconstant, partly because of the small number of the cases studied. It was necessary when reporting results to state the mental condition of the patient in exact terms. Dr. Duncan had found that the serum-cholesterol was high in cases of dementia præcox showing emotional indifference, and—within normal limits—in those characterised by confusion or emotional excess. When a dull patient became agitated his serum-cholesterol was much lower. In mood psychoses, also, the cholesterol content was high during remissions, falling with a relapse into the manic or melancholic state. Chronic alcoholism showed similar changes. In 1928, while treating with thyroid extract a patient with dementia præcox whose appearance suggested sub-thyroidism, Dr. Duncan had recorded a fall in serum-cholesterol of from 502 mg. to 158 mg. per 100 c.cm., and coincidently there was a great improvement in the mental

state. When the treatment was suspended, the cholesterol rose to 414 mg. and apathy returned. The research showed that lecithin and cholesterol were in some respects antagonistic. It seemed that the greater the amount of cholesterol present, especially in proportion to lecithin, the lower was the metabolic activity of the cells. Among the conclusions drawn were the following: blood-cholesterol was lowered in cases of heightened emotion and quickened psychomotor activity; it was raised in apathy and diminished psychomotor activity; when the cholesterol in the blood and tissues was lowered an increase in the metabolic rate was to be expected and a therapeutic raising of the blood-cholesterol acted, in some cases, as a sedative on the nervous system. But there were many agents by which the rate of activity of the nerve-cell might be influenced. The research might throw light on a very obscure corner of physiology.

Dr. EDGAR A. DOLL (Vineland, New Jersey, U.S.A.) read a paper entitled

Community Control of Mental Deficiency in U.S.A.

His thesis dealt in a detailed manner with the subject. It was concluded, he said, that 1 per cent. of the total population of the States were mentally deficient, and 2 per cent. at least of the school population could be so classed. Nearly every State had at least one institution for them. In 1928, 65,000 mentally deficient people were under care, so that only 6 per cent. were cared for in institutions. The cost was about £100 per annum per head. Many patients were being successfully placed on parole, which made care of a larger number possible. In the educational aspect, 2552 special classes had been formed; few schools tried to do anything for the really low grade. Clearly the majority of mentally deficient persons resided among the community, so that this constituted the most serious aspect. The visiting teacher was an important aid, but there was little in the States in the way of occupation centres. Community supervision in rural districts presented a very difficult problem because of the distance to be covered in relation to the small number to be served. Apparently the States population were more optimistic as to the possible good from sterilisation than in England. In the States selective sterilisation was favoured, and a temporary commitment to an institution for this purpose. Great stress was laid in U.S.A. on the need of research.

Demonstrations and Social Functions

During the meeting a demonstration took place at the Royal Institute for Mental Defectives at Colchester, where training is being carried on under a special grading system to suit the particular classes of inmates. The workshops and recreation arrangements testify to the success of the organisation. Lord STRADBROKE, the chairman of the institution, spoke of the enthusiasm of the work in progress when presiding at a luncheon to the members of the association held in the Moot Hall, Colchester.

The Annual Dinner

Dr. TURNER presided over a distinguished company at the Grand Hotel, Clacton, on Wednesday. Sir ROBERT ARMSTRONG-JONES, in proposing the Health Services, pleaded with the Minister of Health to secure recognition of the Association's certificate for nurses, and to see that research at mental hospitals should be recognised in State grants. But Sir HILTON YOUNG refused a decision, remarking that the post-prandial state was characterised not only by receptivity but also by delayed reactions. He thought that the Association could be a real safeguard against bifurcation into branches devoted to mental deficiency and mental disorder, and in emphasising the unity of medicine he expressed regret that teaching hospitals have made little use of their right to take in mental cases. Until they did so they could not be regarded as general hospitals. Mr. P. J. PYBUS, M.P., amusingly proposed the toast of Law and Medicine, drawing replies from Sir LESLIE SCOTT, who laid stress on the sanctity of the law, and Sir HENRY BRACKENBURY, who said that he was more and more impressed by the overwhelming importance of psychological medicine. The toast of the Guests, proposed by Dr. W. MASEFIELD, was answered by Mr. OSWALD LEWIS, M.P., and by Lord DUNWICH, who spoke of the regrettable insularity of professions. The hour being now past midnight, Sir FRANCIS FREMANTLE, M.P., proposed the concluding toast of the President. In the treatment of mental cases, he said, it had all along been necessary to face the combination of demands by the community for safeguards against the individual, and the demands of the individual for the safeguarding of his or her own natural rights. It was here that the Association had so distinguished itself, recognising as it did the dual responsibility. Its duty remained to show that mankind manifested every shade of variation, whether from insanity, inheritance, or otherwise.

MEDICINE AND THE LAW

Walton *v.* Lief and Natural Healing Ltd.

THE system of trial by jury may be the least unsatisfactory method of disposing of cases about medical treatment, but the requisite unanimity of 12 jurors is notoriously not attained without compromise. The resultant verdict may represent a view which no single juror holds.

Mrs. Walton's recent action seems to be a case in point. She had suffered from lupus erythematosus since 1921 and had tried various treatments. By 1926, she said, the disease seemed to have quieted down. In 1932 she was recommended by friends to consult Mr. Stanley Lief, an unregistered practitioner who conducts a sanatorium at Champneys, Wigginton, near Tring. She entered this establishment on Feb. 20th and was put on a strict fruit diet. On March 8th she was given, according to Mr. Lief's evidence, mercury-vapour lamp treatment, the lamp being placed 30 inches from her face for one minute. This dose of light was increased, the biggest being for eight minutes at the same distance. Mr. Lief thought the patient's face looked much better when she left on March 24th. She came to his house in Park-lane on April 4th, when he used a Kromayer lamp, placed 1½ inches from her face for one minute. He said he saw no change in her face on April 11th when he gave similar treatment. Mrs. Walton eventually sued Mr. Lief (and Natural Healing, Ltd.) for personal injuries alleged to be caused by the defendants' negligence and breach of warranty. On the latter point she said that Mr. Lief had definitely undertaken to cure her and had failed. In April, 1931, there had been one or two scars on her face but none on her scalp; after she had been treated by Mr. Lief the disease had extended over the whole of her scalp and both sides of her face, the disfigurement being permanent. As to the negligence, she said she was wrongly and improperly treated by radiation and that the diet given her was insufficient.

Lord Horder, giving evidence for the plaintiff, said that irritants were to be avoided; they produced a recrudescence of the disease and a more acute condition. Very small doses of X rays might have a healing effect but they must be measured with extreme care. He would not himself have recommended radiant heat for Mrs. Walton. Starvation treatment was a bad preface to local treatment; it might make the patient more susceptible to overstimulation. It was an unfortunate type of case to get into the hands of inexperienced persons because wrong treatment might do great harm. Medical practitioners, giving evidence in support of the defendant, expressed the opinion that Mrs. Walton might have benefited by ultra-violet rays; the disease "flared up," they said, for reasons which were not known and were not necessarily connected with the rays. One of these witnesses for the defence, Mr. J. E. R. McDonagh, stated in cross-examination that, when treating patients for this disease, he had never advised them to have starvation for a month; he himself would not now advise ultra-violet ray treatment because other treatment might achieve better results.

On the issue of the warranty Mr. Lief denied having promised to cure; he was pressed, however, with statements in his newspaper *Health for All* to the effect that no disease (except cancer, tuberculosis, and paralysis) was incurable at Champneys.

The Lord Chief Justice having summed up, the jury withdrew. After two and a half hours they asked if a majority verdict would be accepted by the parties; the answer was in the negative. Half an hour later they returned the following findings. On the question whether Mr. Lief and Natural Healing, Ltd., had represented and warranted that he was in a position to effect a complete cure of Mrs. Walton's disease, they found for the plaintiff; on the question of negligence they found for the plaintiff also. But their award of damages was surprising. They limited the damages for the breach of warranty to £123 16s., "the amount of the bill as stated in court," and they awarded only a farthing for the negligence. These awards of contemptuous or trivial damages raise important technical questions about costs for future argument and determination. It is a reasonable inference that the verdict was a compromise. If Mrs. Walton was (as the jury finds) the victim of negligence and a broken guarantee, substantial damages might be expected to follow. Yet if trial by jury occasionally produces these odd results, what is the alternative? Decision by medical experts is accepted in workmen's compensation cases but a tribunal of medical experts would scarcely have been acceptable to both sides in Walton *v.* Lief.

THE JURY'S RIDER

The jury added a rider that all institutions of the character of Champneys should be subject to supervision by some Government authority. To this invitation Parliament is unlikely to respond. Orthodox medical practice can always count on its critics; anyone who supposes that Parliament is a zealous supporter of the vested interests of registered medical practitioners need only be reminded that, when the 1927 Act subjected nursing-homes to registration and inspection, Section 7 allowed an important exception. The public must learn the value of the relative qualifications of healers. Mr. Lief's credentials, alphabetically stated, included the letters M.N.C.A. England, D.O., D.C., and N.D. He explained them to Sir Patrick Hastings. M.N.C.A. means Member of the Nature Cure Association and has, as Lord Hewart elicited, nothing to do with chartered accountants; Mr. Lief obtained this title without examination; it is not a degree, though the Association has schools in America. The suffix "England" means that there is a branch in this country; Mr. Lief is president of that branch. The degree D.O. (doctor of osteopathy) was conferred on him in 1920 by the American College of Osteopathy after examination by a body on which doctors were represented. For his D.C. (doctor of cheiropractic) he attended the American College of Cheiropractic in Chicago which seems to be connected with the College of Osteopathy. The degree of N.D. (naturopathic doctor) he obtained at the Macfadden College, Chicago, to which a health resort is attached. Nobody suggests that these qualifications are spurious. Lord Jessel's University Degrees Bill, if it passes, will not touch Mr. Lief's degrees, titles, and descriptions, except that, in so far as they are exotic, the Bill proposes that the name and place of the institution which conferred them should be stated. An imposing series of letters after a name (the word imposing is used in the best sense) is employed presumably to impress prospective patients; naturally it is desirable that the latter should be able to assess relative values. There is neither tariff nor quota for medical qualifications, but there may be patients who prefer the home product.

The public should also be enabled to distinguish, if it so wishes, between registered medical practitioners who are remunerated by fees and are debarred from indirect commercial exploitation of remedies and other practitioners. Mr. Lief was associated in his practice and in the recent litigation with a company called Natural Healing, Ltd.; it has, he said, about a dozen shareholders and he himself holds 5425 out of the 10,000 shares. The company owns the newspaper *Health for All*; it also owns the Sani-Supplies Company which sells certain foods and apparatus. Mr. Lief and two other directors own 20,000 ordinary shares in Modern Health Products Ltd., a concern which sells Natex Health foods. These undertakings advertise in *Health for All*, of which Mr. Lief is editor. There is nothing sinister in this interlinking of commercial interests, but the public possibly does not appreciate the fact that professional etiquette discourages the orthodox doctor from adopting such a system. Mr. Lief has had as many as 100 patients at Champneys at a time; Mrs. Walton says she was charged 12 guineas a week for a room on the top floor. With *Health for All* stating that no disease except the three already named is incurable at Champneys, and with Mr. Lief guaranteeing (as the jury found) to cure lupus erythematosus, it must be a profitable business. Nobody suggests that treatment at Champneys has always been as unsuccessful as it was in curing Mrs. Walton's disease. But others besides the Lord Chief Justice will wonder how far osteopaths are qualified to administer radiant heat treatment and by what process of elasticity the use of the mercury-vapour lamp is brought within the province of nature cure.

Workmen's Compensation (Medical Referees' Powers)

Litigation over workmen's compensation has been copious, but an important question about a medical referee's powers has remained undecided until the House of Lords settled it last week in Wemyss Coal Co. *v.* Haig. Dermatitis produced by dust or liquids is one of the industrial diseases within the Workmen's Compensation Act, so that disablement

therefrom amounts to an accident entitling the workman to compensation. Haig, a mine repairer, contracted this disease in 1928. Disablement began on Dec. 10th of that year; the Wemyss Coal Co. admitted liability and paid compensation till June, 1930, when he commuted his claim for a lump sum payment of £100. He was re-employed above ground in 1931 and was presently sent underground for a short time when he again suffered from dermatitis. Being disabled from earning full wages by reason of the industrial disease, he obtained from the certifying surgeon a certificate of disablement as from Oct. 20th, 1931. Under Section 43 (1) (*f*), if either the employer or the workman is aggrieved by the action of the certifying surgeon "in giving or refusing to give a certificate of disablement," the matter may be referred to a medical referee for final decision. The employers, alleging that they were aggrieved, caused the matter to be thus referred. They were not so much aggrieved by the giving of a certificate of disablement as by the fact that the certifying surgeon dated the disablement as at Oct. 20th, 1931; they argued that the dermatitis was not a new disablement but a recurrence of the old disablement of December, 1928. The medical referee found that Dec. 10th, 1928, was the date on which the disablement from dermatitis began. Thus in effect he altered the date fixed by the certifying surgeon. The Court of Session held by a majority (Lord Murray dissenting) that the medical referee had no power to alter the date. The employers appealed to the House of Lords where a strong court unanimously took the opposite view.

How, it may be asked, do two sets of distinguished judges manage to differ thus in interpreting the Act? The answer is that a proviso to Subsection (2) of Section 43 expressly authorises the medical referee to fix the date of disablement where he allows an appeal from a refusal by the certifying surgeon to grant a certificate. There is a principle of statutory interpretation that, if one thing is expressly mentioned, another thing not so mentioned is deemed excluded. It was therefore arguable that if Parliament expressly authorised the medical referee to fix the date of disablement in one case (on refusal of a certificate), he had no authority to fix it in other cases not expressly mentioned. The Scottish court acted on this principle. The House of Lords felt able to take a wider view. Lord Atkin contrasted the functions of the certifying surgeon, exercised at the instance of one side only, with those of the medical referee which are exercised after hearing both sides; the medical referee, he said, has appellate jurisdiction and remedial powers. The certificate as a whole is subject to appeal. A self-respecting medical referee would hardly be content merely to affirm a certifying surgeon's decision which seemed correct as regards the fact of disablement by disease, but incorrect (perhaps by six months) as regards the date of the onset of the disease. Lord Atkin did not suppose medical referees had in practice regarded themselves as unable to alter the date of disablement; if they altered the date of disablement, they were within the law. Thus an important legal point is cleared up, but we are still left wondering why a victim of industrial disease is allowed to expose himself a second time to the risk of disablement.

Property in Radiograms

If a radiogram is made in the course of diagnosis and treatment, who is the owner? The *Journal* of the American Medical Association (June 17th) summarises a recent judgment of the municipal court of Dayton, Ohio, on this subject. The court decided that the radiogram does not belong to the patient unless there is express agreement to that effect. The facts in the case were briefly these. A dentist advised that an X ray photograph be taken of a patient's teeth. This was done at a charge of 10 dollars. At a second visit the dentist stated his diagnosis and recommended certain work, charging 5 dollars for his services on this occasion. The patient decided not to have the proposed work done and asked for the radiogram which the dentist declined to hand over. The patient paid the 5-dollar charge, but refused to pay the fee for the radiogram. The dentist sued for the latter fee. The court held that radiograms are not bought and sold like other chattels. The dentist or doctor equips himself, said the judge, with the X ray machine; the resultant photograph is part of the record of the case and part of his office equipment; its sole value is for the purpose of diagnosis and professional information. The dentist or doctor sells, and the patient buys, professional knowledge and experience, not mere photographic material. In the litigation in the Ohio court the plaintiff dentist gave evidence that it was customary for the possession of radiogram films to remain with the person who has taken them; there was no evidence of any express agreement to transfer ownership of the film from plaintiff to the patient. The court expressed the opinion that the retention of the film by the person who made the radiogram was necessary as part of the records of the case. The radiograms, it seems, were classed with temperature charts and other data collected and preserved for professional services towards the patient. The court declined to imply a contract to hand over the films or photographs to the patient. The decision is understood to coincide with previous American decisions though no ruling has yet been given by an appellate tribunal. The point seems not yet to have been examined in the English courts, though a correspondent raised it in our columns 18 months ago (THE LANCET, Jan. 2nd, 1932, p. 56).

In the American case the dentist seems himself to have supplied the radiographic appliances and results. If in England a doctor or dentist calls in the services of an independent expert in order to obtain a radiogram, other elements are introduced. Is the doctor or dentist an agent? Does the patient enter into any contract with the maker of the radiogram? The Copyright Act contains definite provisions as to copyright in a photograph, but copyright law is outside our discussion unless some question of publication arises. The American court's view that radiograms are, like temperature charts, part of the records of the treatment of particular patients, is useful. So long as there is continuous treatment by the same medical adviser, it would be natural that radiograms should remain in his custody; and possession is nine points of the law. If the patient summarily changes his doctor, can he persuade a judge to say that the later doctor is entitled to see the earlier doctor's case-book? What has the patient been paying for? Treatment alone, or treatment plus records? All these questions of express or implied contract will have to be decided upon the special facts of each case whereon professional practice and custom will throw light. A final consideration is that the detailed information acquired in diagnosing and treating patients is confidential. A surgeon who spends his days in removing appendices or gallstones may not always, in Lord Riddell's words, "realise that his patients may desire to preserve the secrets of their truncated anatomies." But it would

be unfortunate for the dissemination of professional knowledge if experienced practitioners were prevented from the discreet and anonymous citation of individual cases in support of general conclusions.

Medical Club Fraud

Philip Morris, an unemployed labourer, was sentenced to 15 months' hard labour at Liverpool Quarter Sessions last month on charges of forgery and fraud in connexion with the "Merseyside Medical Club." The accused in his evidence said he was originally a miner and had experience of medical clubs at collieries. He and his son instituted the club to provide medical attention and treatment for mothers and children under 16 for a subscription of 6*d*. a week per family. The doctors were to receive 13*s*. a year, subsequently increased to 15*s*. a year, for each family. As many as 70 members had been enrolled. He employed canvassers and agents and paid £102 rent for the club premises. He made no money out of the club but had hoped it might be a means of living for his son. The undertaking would have made money, he said, if the British Medical Association had not circularised the doctors associated with the club and caused them to withdraw their services at short notice. The assistant recorder deprecated any digression into questions of medical ethics. After the jury had found its verdict, a police officer said that Morris had previously been in trouble over the Midland Thrift and Benefit Society which he had founded in Liverpool. He had been prosecuted for misapplying friendly society funds and had been fined (with the alternative of imprisonment) and ordered to pay 50 guineas costs. Last March he was fined for fraudently abstracting electricity at the premises he occupied. Lately he had been receiving 23*s*. a week by way of public assistance. The assistant recorder, passing sentence for what he described as cruel frauds on the unemployed, recommended that there should be closer supervision of medical clubs of this kind; "possibly the City Council will see that some by-law is passed that people who form these societies should register and give particulars with regard to capital and working arrangements." Legislation by local Act rather than by by-law would probably be necessary, but a statute of general application would be better still. It is obvious that those who institute and manage undertakings of this nature should be persons of responsibility and approved character.

IRELAND

(FROM OUR OWN CORRESPONDENT)

NURSES AND THE SWEEPSTAKES

In the Senate last week, in the discussion on the Public Hospital Bill, an amendment was carried which empowers the Minister to give grants from the Sweepstakes' Funds "to any organisation established in the Saorstat for the provision of a pension fund for aged and infirm nurses." Opposing the amendment, Dr. C. Ward (Parliamentary Secretary to the Department of Local Government and Public Health) said he would like to see pensions for nurses who had to give up their work through incapacity, old age, or infirmity, and he would also like to see their remuneration prospects and status generally improved in this country. But the amendment did not set up a pensions scheme, and did not say what organisation would be responsible for the administration of such a fund; nor did they know whether the nurses would be expected to contribute to it. The amendment would virtually shift from the hospitals and local authorities responsibility for the superannuation of certain classes of nurses.

The discussion showed that those who supported the amendment were moved by sentimental motives, and references were made by them to the fact that "nurses were shockingly badly paid." Medical men, above all others, are likely to have sympathy with the position of nurses, but the fact that any particular class of the community is badly paid is no reason for demanding that it should be helped out of funds raised by the hospitals for charitable purposes. The remedy is to put the nursing profession on a sound economic basis. The nurses themselves in looking for or accepting quasi-charitable assistance are signifying their acquiescence in their present conditions of employment.

NATIONAL HEALTH INSURANCE

The Select Committee of the Senate on the National Health Insurance Bill, having collected a considerable volume of evidence on the subject running to some 68 closely printed pages, has contented itself with a report of a few paragraphs. It expresses the opinion "that it is essential that the National Health Insurance Bill, 1933, should be passed if a scheme of national health insurance is to continue without serious financial embarrassment. The main defects in the present system that appear from the evidence tendered would seem to arise from the difficulty of control in the matter of medical certification and from non-compliance with the existing law. In both these respects it is likely that the provisions of the National Health Insurance Bill, 1933, will enable improvements to be made." The committee adds two minor amendments dealing with compensation to existing officers of approved societies.

It is possible that non-compliance may be less with a unified society, but one can hardly find much support in the evidence for the view of the committee that medical certification will be rendered more effective by the change. There is a real danger that the interests of the sick member may be sacrificed.

EDINBURGH HOSPITAL FOR CRIPPLED CHILDREN.—Mr. Noel Skelton, M.P., Under-Secretary of State for Scotland, recently formally opened this hospital at Fairmilehead. The building and its equipment have cost over £96,000, and there is accommodation for 150 patients. There is a per capita charge of £2 5*s*. per week for patients paid for by local authorities; private patients pay £2 15*s*. A plan of coöperation between Edinburgh corporation and the hospital is being prepared. The institution actually began to receive patients ten months ago, and during that period 43 patients have been admitted; 11 have been cured and 12 sent home with their condition improved.

WINGFIELD-MORRIS ORTHOPÆDIC HOSPITAL.—On June 30th the Prince of Wales opened the new buildings of this hospital at Headington, Oxford. The institution has hitherto mainly been housed in the wooden Army huts of an old war hospital. When it was no longer feasible to keep them in repair, Sir William Morris offered £70,000 for complete rebuilding. The new buildings, which are a quarter of a mile long, include, among other accommodation, private, recovery, women's and children's wards, a gymnasium, and a thermal bath. Mr. G. R. Girdlestone, the honorary surgeon, has defrayed the cost of rebuilding the workshops, which give two years' training to about 30 crippled young men in carpentry, shoemaking, and the like. The old Wingfield Hospital has been renamed in honour of Sir William Morris, to whose generosity the Prince of Wales paid a warm tribute.

THE FREEMASONS HOSPITAL

ON Wednesday of this week the King opened the new Freemasons Hospital at Ravenscourt Park, Hammersmith. The Brotherhood have long desired a larger and better hospital than the one in Fulham-road, but the late war postponed any realisation of their hopes. At the same time, if the new hospital had been built even five years ago it could not have come up to its present standard.

The aim has been to make the building an expression of the need to cure the patients and also to enlist the help of nature in the process. Thus the design is calculated to give the maximum amount of light, air, and cleanliness. All the roofs are flat; the window-spaces are enormous, in the modern plan of masses of horizontal rectangular panes. One of the most striking features of the building is a number of great projecting semi-circular sun balconies. The landings are lighted by shafts of glass running sheer from ground to roof. The buildings are surrounded by lawns and beds of flowers, and the site, although only about five miles from Harley-street, is almost rural, for Ravenscourt Park gives it an open outlook on two sides, and the upper windows look out to the open country of Hounslow Heath and the Surrey hills.

The hospital consists of four blocks built in cubical masses of red brick. The main entrance is on the east side, opposite the park, in the administration block, which is T-shaped with the head of the T parallel with the road. Opening off the large main hall, with its dedication stone, are passages leading to the numerous offices, dining-rooms for typists and doctors, waiting-rooms and cloak-rooms necessary in the running of the hospital. On the first floor are the resident doctors' bedrooms and sitting-rooms, the reception-room, and the board-room, with two roofed terraces. Above are the flats of the matron and assistant matron, and highest of all are the quarters of the cooks and food supervisor.

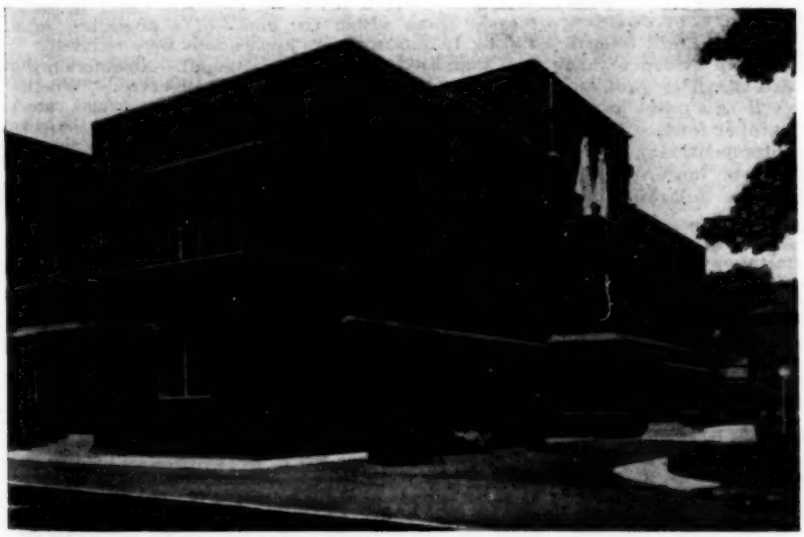
The back of the administration block opens into the ward block, which is U-shaped and five floors high. This building contains 120 single-bed wards and 20 four-bed wards. These rooms are decorated in quiet green colours; they are sound-proof and beautifully lighted; each patient has his own bell-push, set in a rubber ball, so that he can keep it in bed, a plug for wireless head-phones, and a bed-light. The bell gives a visible as well as an audible signal. Each ward has a fitted basin and tubular steel furniture. Each group of wards has a sluice-room, with a cascade sink for bottles and an automatic washing cabinet for bed-pans, and each floor of each wing has its own kitchen fitted with hot cupboards, milk boiler, and

One of the sun porches of the ward block.

gas stove, where simple meals can be prepared and where most of the food arrives by lift for distribution. A sister is in charge of each floor and sits in a room open to the corridor, containing the medicine and poison cupboards, and the switch which adjusts the strength of the broad-casting.

The children's wards are on the third floor, with wide roof terraces, and the kitchens and food stores are on the top floor, where they can neither be heard nor smelt. Special kitchens are devoted to kosher food for Jewish patients and to the preparation of special diets. The nurses have comfortable rooms for their use on duty and in their short intervals of leisure, but at present they have to walk over from the nurses' home in Fulham-road. One of the chief needs of the hospital is its own nurses' home, and this will shortly be supplied. The ward block has a system of light signalling by which any member of the staff can be summoned to the telephone.

From the back of the ward block a passage opens into the small annexe block, which contains the boiler rooms and the ambulance reception hall, and behind that again is the electrical and surgical block. The ground floor of



The front of the Administration Block.

this block is filled with the staff dining-rooms, kitchens, and pantries; on the first floor are the radiological and physiotherapy departments, and on the second the operating theatres. The radiological department has not yet been fitted up, but it will have the largest installation of the kind in the country. The generators will be capable of an output to the tubes of 5 amperes. The physiotherapy department is fitted with many kinds of electric bath, apparatus for light treatment, and a gymnasium for remedial exercises. These two departments are the only ones admitting out-patients.

The surgical floor shows much ingenuity of design. There are two groups consisting of anæsthetic rooms, operating theatre, and sterilising rooms, and between the two groups are a plaster-cast theatre and an X ray theatre. The surgeon undresses in a cloakroom with fitted basins and shower-bath, puts on a sterile change of clothing and walks into the anteroom where he scrubs up and finds his gown, mask, and gloves, and where his instruments are ready prepared for him; he walks through to the operating theatre and meets the patient, who has come from the anæsthetic room. After work he leaves his theatre-dress in the anteroom and goes back to his own dressing-room. This floor contains special theatres for ear, nose, and throat work, eye work, dentistry and the like, and rooms for surgeons and staff. The sterilisers are fed from the central boilers, and are of the enclosed type, which has not been seen much in this country but which is very comfortable in use. Before they are opened a tap is turned and the chest is flooded with cold water to condense the steam and cool the instruments to handling temperature.

The whole building is almost fireproof, but is equipped with elaborate fire-fighting appliances. Fire-alarm buttons are placed at suitable points and show a red light and sound a buzzer in the quarters of all responsible officials, though no alarm is given to the patients. The hoses are of small size, capable of being handled by women, and two chemical extinguishers are kept in each hose cupboard. The steam supply for the whole hospital is generated at one point. The boilers are oil-fired, and the hospital is heated by vapour circulated by means of vacuum pumps. There are 14 electric passenger lifts, including two special bed-lifts, with self-levelling devices at every floor. A unique feature is an emergency button which, if a lift stops between floors through electrical failure, will allow it to be moved to the next floor. In addition there are lifts for food, supplies, soiled linen, soiled dressings, and X ray photographs.

The architects are Sir John Burnet, Tait and Lorne, and the total cost of the hospital has been about £335,000. The chairman of the medical advisory committee is Sir D'Arcy Power.

PUBLIC HEALTH SERVICES

Malnutrition in Children

THE early reports for 1932, reviewed in this column on June 17th, gave an impression that "malnutrition in school-children is not common, but its comparative rarity must be due to the many active measures taken to combat it." Those that have reached us since then bring out the fact that school medical officers of different localities see very different aspects of this problem.

Some of them, perhaps the majority, do not think it necessary to comment at all on unemployment and its effect on children; nor do they record any special measures for supplementing diets. Others have evidently given careful consideration to the situation, but do not lay much emphasis on damage resulting from pure poverty. Thus Dr. A. W. Forrest states that subnormal nutrition is not an important, nor very common, defect among Leyton school-children. "For the most part, these cases are due to a temporary derangement of health, a hereditary factor, unsuitable dietary, or in a few cases insufficient food." Dr. J. A. M. Clark reports that in Walsall there is as yet little evidence that malnutrition exists to any extent. The problem to-day, he says, is no new one; it is a problem not so much of insufficient as of improper food.

A third and large group of reports mention increases in feeding at schools and express more or less satisfaction with the results. The following are examples:—

EDINBURGH (Dr. John Guy).—Measurements of height and weight continue to show a general upward trend and the diminution in children with bad nutrition is also noteworthy. Last year the education committee supplied, during the session, 1,176,634 dinners to scholars. The daily number of children, at the close of the session, receiving the meal was 6221 of whom 4720 were on the free food roll. Under the milk scheme 5025 children got a daily ration, on payment, of Grade A (T.T.) milk, and 342 got free milk because, despite free meals, they still seemed to be too poorly fed to profit by the education offered. (A recent inquiry into the physical condition of 77 Edinburgh families revealed no cases in which there was undernourishment because of lack of means; see THE LANCET, July 8th, p. 98.)

NUNEATON (Dr. P. G. Horsburgh).—There is no provision of milk under the Education Act (Sections 82–85), but the education committee have a scheme for supplying milk during school hours to those who need it. This has done much good and is of great benefit to the selected children.

EDMONTON (Dr. H. W. Harding).—Unemployment is marked in the district and is reflected in the amount of milk granted by the maternity and child welfare committee and the number of free meals to necessitous children under the arrangements made by the education committee. With regard to the former, the restriction made during 1931 was still in force—namely, that milk should be given to mothers only who are in regular attendance at the welfare centres. The number of free meals to school-children was over 56,000 in 1931 and nearly 113,000 in 1932.

KETTERING (Dr. C. B. Hogg).—Only two definite cases of malnutrition were found during the year. This small number, notwithstanding the increased amount of unemployment, is no doubt due to the provision of milk in school and meals at the school canteen centre.

BURY (Dr. G. Granville Buckley).—The corporation has arranged for the provision of free milk (fresh and dried), or milk at half cost, to necessitous cases in which the family income comes within the limits of a prescribed scale. During 1932 many more applications were received.

WARRINGTON (Dr. G. W. N. Joseph).—No deterioration in the nutrition of the child has been observed. "Whether or not this is due to the 'milk in school' schemes cannot definitely be assessed. I think it is, but whatever the cause the result is one which we are glad to record, as showing that the nutrition of the school-children in Warrington is not suffering in these times of economic stress."

LANCASHIRE (Dr. J. J. Butterworth).—The percentage of children showing malnutrition at the routine inspections was 1·55 (compared with 2·16 in 1930 and 1·48 in 1931). The children in receipt of free meals or milk, cod-liver oil, &c., form about 7·75 per cent. of the children on the roll of the elementary schools. The selection for free meals is made on an economic basis in accordance with a scale fixed in 1929. During the year it was found necessary to allocate a further sum of £5000 in the estimates for the cost of free meals, and the expenditure under this heading is now at the rate of £25,000 per annum. "It is quite evident that the expenditure of this money has been of considerable value in keeping down the percentage of malnutrition to the low figures ascertained for this and the previous year, if the routine groups may be regarded as a fair sample of the whole." "It would appear that the health of the elementary school-children has not been adversely affected to any noticeable extent by this depression."

Where the statistical returns seem satisfactory the question remains whether they tell the whole truth. "It is almost impossible to understand," says Dr. Kenneth Fraser, "why the malnutrition figure among the elementary school-children (in Cumberland) does not rise under existing conditions. There is no doubt that large numbers of children are carrying on to-day in this county without adequate food." As a rule, however, a shortage of food falls rather on the parents—especially the mothers—than on the children; and while there is so far no general incidence of malnutrition there were at the end of last year 1204 children receiving free milk on account of their debilitated condition. Moreover, he believes that height and weight do not afford a complete index of health; an imponderable failure of nutrition may impair resistance to influenza or tuberculosis. (Incidentally Dr. Fraser does not believe in distributing milk throughout the year. More children could get benefit if there were occasional breaks, and it would be well to concentrate on the first three months of the winter.)

Dr. W. M. Ash says that inquiry in Derbyshire last October suggested that the school-children were faring better than one would anticipate, but adds: "I would like to make it quite clear that this is not to be interpreted that I am satisfied that the children are getting plenty. There are many instances of poverty where the bare necessities alone are being provided." At Darlington Dr. G. A. Dawson records that for 18 years the average height and weight has increased consistently in all age-groups, but also says: "One must admit that the adequate feeding of a growing school-child cannot be carried out with any measure of ultimate safeguarding of the health on the meagre national allowance of 2*s*. per head over a prolonged period. Similarly, Dr. A. A. E. Newth, of the city of Nottingham, in reporting that no deterioration of health has yet been observed, remarks that "recent publications on the feeding of children, when taken in conjunction with the amount of money known to be available in the homes of many of our families, suggest that there must be a large number of children who are not receiving adequate diets." The same point is made by Dr. Thomas Gibson, who finds a continuing improvement in the nutrition of the children, but adds that there are a large number of families in Wakefield where adequate or proper feeding is not being carried out, and can scarcely be carried out, because of lack of money.

"The stock diet of these families," he says, "almost wholly farinaceous, may not lead to obvious malnutrition in the ordinary sense, but it is bound to affect their stamina and resistance to disease. I have noticed lately at the school clinic an unusual number of cases of eye affections, such as blepharitis and phlyctenular conjunctivitis, and I am inclined to think that improper feeding may be, at least, one of the causes. It is indeed difficult to see how children can be fed properly on the income of some of these families. A recent inquiry, based on the applications for dried milk under the maternity and child welfare scheme, showed that there were 160 families, many of them including school-children, where the income per head per week, after deducting the rent, was less than 6*s*. and in some cases less than 5*s*. or even 4*s*. Out of this allowance have to come food, clothing, fuel, lighting, and all the general household expenses. Some mothers are better managers than others, but it is difficult to see how the most efficient mother could adequately feed her children out of the low sums allowed, even if she had nothing else to spend the money on."

Dr. Gibson comes to the conclusion that there must be a considerable amount of insufficient feeding in Wakefield. The extent of this insufficiency is not to be gauged by the number of malnourished children in the schools, but by the degree of poverty or necessity existing in the families from which the school-children are drawn.

Another medical officer who is evidently anxious to dispel any undue optimism is Dr. Vynne Borland. Writing of Bethnal Green he says:—

"While unemployment insurance benefit and public assistance go some way to mitigate the worst results of this long-continued acute poverty of a large section of the population, I am increasingly anxious concerning its eventual effect upon the health standards of the borough. It will be remembered that the actual results of the physical deterioration of the peoples of Central Europe in consequence of the blockade during the Great War did not fully manifest itself until after the war. Similarly it may be that we shall not be able to estimate the true reflex of the present deprivations for some years and not alone in possibly raised morbidity- and mortality-rates but in the set-back to the rising standard of health which was fairly definitely indicated before the present industrial depression."

At Bethnal Green Dr. Helen Mackay conducts a special consultation clinic, and Dr. Borland quotes her statement that although the children seem to be of much the same type as in previous years there is a definite falling-off in the health of the mothers. If this be so, she says, the retrogression before long is likely to affect the children too.

Of the few reports that offer evidence that failure of growth had already taken place last year, the most striking is that of Blackburn, where Dr. V. T. Thierens finds that the standard of nutrition continues to decline, and in the case of boys is now actually lower than during the war. Further south Dr. Dunstan Brewer notes "some decline" in the level of nutrition at Swindon, where 89 children definitely malnourished were discovered, compared with 34 in 1931. At Bury St. Edmunds, again, Dr. Ernest Stork holds that a striking increase of defects among school entrants may easily be attributed to recent economic conditions. On the whole, however, the tone of the reports is reassuring about the effects of the crisis on the physique of English children. The reserve which remains in the mind of readers was well expressed in an editorial last week in the *Medical Officer*. After referring to the great adaptability shown in childhood the writer points out the difficulty of being sure whether this adaptation is physiological or pathological. The article continues:—

"So it is just possible that our children *can* live on unemployment diet and that our failure to find ill-nutrition amongst those who have to submit to it is really due to there being no malnutrition to discover. But against this we have such weighty physiological arguments that most of us believe that the malnutrition is there but that we are ignorant of the form it takes and so do not detect it. The politician is relieved that so far we cannot say that our children are suffering from the depression; but the physiologist is not, for he knows that the worst troubles of man are those that lie latent, to be revealed only when the organism is exhausted and incapable of relief."

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 1ST, 1933

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 14 (last week 8); scarlet fever, 2249; diphtheria, 770; enteric fever, 42; acute pneumonia (primary or influenzal), 600; puerperal fever, 37; puerperal pyrexia, 75; cerebro-spinal fever, 29; acute polio-myelitis, 13; acute polio-encephalitis, 3; encephalitis

lethargica, 8; dysentery, 21; ophthalmia neonatorum, 77. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 4th–5th was as follows:—Small-pox, 35 under treatment, 1 under observation (last week 39 and 1 respectively); scarlet fever, 1873; diphtheria, 1621; enteric fever, 13; measles, 483; whooping-cough, 371; puerperal fever, 24 (plus 8 babies); encephalitis lethargica, 250; poliomyelitis, 1; "other diseases," 223. At St. Margaret's Hospital there were 22 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In 118 great towns, including London, there was no death from small-pox or enteric fever, 27 (4) from measles, 8 (2) from scarlet fever, 13 (4) from whooping-cough, 22 (2) from diphtheria, 34 (3) from diarrhœa and enteritis under two years, and 17 (3) from influenza. The figures in parentheses are those for London itself.

Nine deaths from measles were reported from Liverpool, 4 from Rhondda, 2 each from South Shields and Bristol. Liverpool also reported 7 deaths from diphtheria; Hull, Manchester, and Birmingham each 2. Four deaths from diarrhœa were reported from Birmingham, 3 from Liverpool, 2 each from Walthamstow, Manchester, Newcastle-on-Tyne, Sheffield, and Nottingham.

The number of stillbirths notified during the week was 281 (corresponding to a rate of 42 per 1000 total births), including 49 in London.

PANEL AND CONTRACT PRACTICE

Some Insurance Statistics for London

IN view of the coming of age of the National Insurance Act to be celebrated next week, the statistical information with regard to London published in an appendix to the last agenda paper of the London Insurance Committee is of especial interest. Among the facts brought to light are the following:—

Lists and registers.—The number of practitioners on the medical list at the end of March was 2049; the number of insured persons at the same date was 1,925,564. This figure is slowly decreasing. During the quarter ending March 31st, 1933, 14,987 insured persons moved from one address in London to another more than two miles away, whilst 21,216 moved out of the County of London.

The average number of insured persons per list (excluding assistants and limited lists) is 1030. Applications for refund of fees (Clause 7 (2) Terms of Service) numbered 280. The amount of fees charged was £52 15*s.* 10*d.*, with chemists charges amounting to £10 16*s.* 10*d.*; 65 fines were imposed, amounting in all to £3 3*s.* 2*d.*

NUMBERS OF INSURED PERSONS PER PRACTITIONERS

The number of practitioners with lists of insured persons is arranged in groups of 250.

There are 514 practitioners with lists of under 250—i.e., just under 25 per cent.—and 1078 practitioners (that is 52 per cent. of the practitioners under contract with the committee) with lists of less than 1000. The limit for any one practitioner is 2500 and there are 642 doctors (31 per cent.) who have more than 1000 but less than 2500. Doctors with longer lists who must either be in partnership or have an assistant are comparatively rare. There are only—

8	doctors	with	between	3500	and	3750	insured	patients.
8	,,	,,	,,	3751	,,	4000	,,	,,
8	,,	,,	,,	4001	,,	4250	,,	,,
1	doctor	,,	,,	4251	,,	4500	,,	,,
2	doctors	,,	,,	4501	,,	4750	,,	,,

In other words 1·3 per cent. only of the doctors under contract have lists between 3500 and 4750. Thus the common impression that most insurance doctors, especially in London, have huge lists is proved to be quite untrue.

Change of doctor.—During the first quarter of the year 5152 transfers were effected.

Prescriptions dispensed.—The total number of prescriptions dispensed during this quarter was 2,835,923, costing £381,122 15*s.* 4*d.* for ingredients and £52,755 2*s.* 2*d.* for dispensing fees. The average cost of ingredients per prescription is 3·23*d.* and of dispensing 4·46*d.* The number of prescriptions per insured person is 1·48, costing 11·37*d.*; both these last figures are much above the average as this particular quarter included an influenza epidemic at the beginning of the year.

PRESCRIPTIONS DISALLOWED

During 1932, 619 prescriptions for appliances were disallowed. These included 193 brushes, 34 droppers (not eye), 88 eye shades, 48 finger-stalls, 43 syringes, 63 wool packets (thermogene or capsicum), and 27 glass or rubber tubes. Thirty-eight prescriptions for preparations which do not form part of medical benefit were disallowed, including camphorated chalk, saccharine tablets, sugar of milk. The cost of 23,666 prescriptions for insulin during the year was £7810 7*s.* 3*d.*; 238 prescriptions, costing £29 14*s.* 9*d.*, for drugs usually administered by a practitioner in person were disallowed, since doctors are paid 1*s.* 3*d.* per 100 persons on their list to cover the cost of such medicaments. Examples of this are hypodermic preparations of morphia (65 prescriptions) and solutions of drugs for hypodermic use such as camphor, cocaine, digitalis, hyoscine, strophanthus, strychnine (in all 22 prescriptions).

It would appear sometimes difficult to decide whether some of these regulations should be so rigidly enforced for it costs much more in labour and postage to write about disallowed prescriptions for, say, appliances that are not in the schedule than the value of the appliance. For example, a temperature chart was disallowed. This could not possibly have cost as much as postages on the letters about it, but it must be remembered that the drug fund pays for the chart whilst the general purposes fund pays for postage.

It is noteworthy that since 1913 nearly 130 million prescriptions have been dispensed in London alone, costing just over four million pounds.

NEW COUNTY WESTMEATH HOSPITAL.—Mr. Sean T. O'Kelly, Minister for Local Government and Public Health in the Irish Free State, recently laid the foundation-stone of the new General County Westmeath Hospital near Mullingar. The cost is estimated at £51,000, of which £44,000 is to come from the proceeds of the sweepstakes and the remainder from the county rates.

INSTITUTE OF RAY THERAPY.—On June 21st the Princess Royal paid an informal visit to this institute in Camden-road, London, N.W. She was escorted over the building by Dr. William Beaumont, the honorary medical director, and the hon. secretary, Miss Winifred Beaton (Mrs. Beaumont). Between Jan. 1st and June 21st of this year the institute carried out 49,809 treatments, and 982 new patients were enrolled. During its three years of existence patients have been referred by 1296 medical practitioners.

CORRESPONDENCE

CLAUSTROPHOBIA IN THE PRISON POPULATION

To the Editor of THE LANCET

SIR,—The case of Thomas Parker emphasises once more a matter to which attention has often been directed in your columns. This man, destitute and obviously "known to the police," was given 14 days imprisonment for sleeping out. In prison he became unruly and violent, and because of this was sentenced to three days solitary confinement on bread and water. His state was by now what a witness at the inquest described as "frenzy" and on the way to the cell he precipitated himself down a flight of stone steps and killed himself.

On pages 106 and 107 of your current issue is a report of a discussion in the House of Commons, in which Brigadier-General Spears claimed that the man had suffered from claustrophobia. This claim was not denied by the Under-Secretary to the Home Office, who said that the prison officer has agreed that claustrophobia was a possible explanation of Parker's frenzy, though he had previously had no reason to suspect such a condition. In my student days I heard nothing from my teachers about phobias and associated conditions, though I recall an allusion to them in a text-book. I pictured them as stupid foibles of eccentric people who ought to have more sense, and I am not surprised that during 12 years of general practice no patient ever complained to me about such symptoms. Of the difficulties of diagnosis in this case I cannot judge—they may have been baffling even to an expert—but if any doctor, trained as I was, failed to recognise claustrophobia in a truculent frenzied man who shouted that he "must get out of gaol even if it were in a coffin" I could only ask what right we have to expect him to recognise it.

At this moment, however, when the teaching of psychopathology is striving for a place in the curriculum, Sir Francis Fremantle's presentation of the subject cannot pass unchallenged. If he had ever had the fortune—good or bad—to see the uncontrollable terror of a phobiac when subjected to his specific stimulus he would not make the mistake of linking phobias with "the objection of every prisoner to being shut in a cell" and declaring that "there was some claustrophobia in the case of every prisoner." I will go further and confidently make the deduction that he has never listened to a phobiac describing his symptoms. He says that one could not define (? diagnose) a claustrophobia "except by a general assessment of the individual's honesty in explaining his feelings, being able to analyse them himself, and to communicate them to the medical man examining him." These a priori diagnostics, with moral judgment as the criterion, prepare us for the statement, "It was extremely difficult to be sure of that condition in a person." With this I am, in a sense, in agreement. There is, of course, less intrinsic difficulty than in many other conditions which we are expected to be sure about, but if we omitted infectious diseases from our curriculum we might hear, concerning typhoid, that "It is extremely difficult to be sure of that condition in a person." Fear of great danger in bringing claustrophobia into legislation has one quality of a phobia, lack of rational foundation. Is claustrophobia in a prisoner to be regarded as something to be sternly ignored?

The Under-Secretary informs us that cases of this kind are not at all uncommon and extremely difficult to diagnose. Let me put it again plainly: these cases are difficult to diagnose *and understand* because few of us have been taught anything about them and diagnosis does not rest upon moral judgment but upon psychopathology. This unfortunate case may serve a good purpose if we are willing to learn our lesson from it.

I am, Sir, yours faithfully,

London, W., July 8th, 1933. MILLAIS CULPIN.

PNEUMODINE IN THE TREATMENT OF PULMONARY INFECTIONS

To the Editor of THE LANCET

SIR,—Various forms of iodine have been employed in the treatment of pulmonary infections and it would be reasonable to expect the best results from the use of volatile compounds of iodine which like creosote and allyl sulphide can be expired through the lungs. About seven years ago I began a chemical and clinical examination of a number of volatile iodine compounds, using them in cases of tuberculosis and comparing, for therapeutic effect and freedom from toxicity, the maximum dose of each which could be well tolerated by the mouth. I found that the allyl compounds, of which pneumodine (β-iodoethyl allyl ether) was selected as the most suitable for extensive trial, showed a therapeutic action too prompt and too definite to be confused with spontaneous improvement, and not to be attributed to environmental factors as most of the cases were treated under the conditions in which the disease had been progressing. Thus some of the cases who had previously been in a sanatorium without improvement or were retrogressing since their return home began suddenly to improve. Cough was relieved, sputum diminished in quantity, sickness due to toxæmia or bronchial irritation passed off in a few days, appetite improved, and night sweats subsided. Weight increased by as much as 1 to 3 lb., in two cases by 5 lb. in a week. In some of the febrile cases with the daily rise to 100° F., normal temperature was regained in three to four weeks. The immediate effect on toxæmia, felt by the patients as increase of vitality and lessening of fatigue, was followed by diminution in chest signs. In most of the comparatively early cases the signs in the chest and the symptoms of activity disappeared in two to six months. Some who resumed their usual occupation have remained in good health since. Good results were also obtained in some old-standing moderately advanced cases of the chronic afebrile type. In others a comfortable standard of health was reached and is being maintained with the continuous use of pneumodine.

In non-tuberculous pulmonary infections—lung abscess, bronchiectasis, whooping-cough, bronchitis, bronchial asthma, pneumonia—the action of pneumodine appeared to be even more prompt. For example, in a case of acute tracheo-bronchitis in a child of three, with a wiry pulse, resp. 60 per minute, temp. 101° F., with all the symptoms of pneumonia but with physical signs consisting only of harsh breathing over two lobes, after two doses of pneumodine emulsion the condition became normal. In a case of lobar pneumonia with definite consolidation of the left lower lobe in a man of 60, first seen two days after the onset, the temperature declined gradually and all

the symptoms abated two days after starting treatment with pneumodine. In a case of bronchial asthma previously treated with expectorant mixture and ephedrine to relieve the difficulty of breathing, not only the cough and wheeziness but also the chest signs subsided in two days, and it was no longer necessary to use ephedrine. Two colleagues have recently reported to me similarly good results in bronchial asthma. Disappearance of sputum has also been obtained in cases of bronchiectasis. Pneumodine appeared to be particularly useful in cases of bronchitis of long duration.

Pneumodine is an unsaturated ethereal compound somewhat like allyl sulphide in its constitution and general characters, but with not nearly so unpleasant a smell. It is insoluble in water but freely soluble in fats and other organic substances. It is sufficiently stable to withstand the ordinary range of reactions within the gastro-intestinal tract, and is compatible with pot. iod., alkaline expectorant, and fever mixtures. In the tissues it hydrolyses rapidly with liberation of free hydroiodic acid. It is best given in the form of a petroleum emulsion or elixir. A palatable preparation, free from the smell of the iodine compound, and containing in each two fluid drachms 30 minims of liq. bismuth cit. and 1/10th grain of codeine phosphate is made by Messrs. Reynolds and Branson, Ltd., 13, Briggate, Leeds. Used in this way, pneumodine is well tolerated. In more than 70 cases of my own no iodism or other drawback has been encountered.

I am, Sir, yours faithfully,

Nottingham, June 23rd, 1933. G. CHAND, M.B., Ch.B.

SEASONAL GROWTH AND HUMAN HIBERNATION

To the Editor of THE LANCET

SIR,—Your annotation of July 1st deals with a hypothesis advanced, apparently in a general way, by A. B. Fitt, and recorded in the report of the Australasian Association for Advancement of Science or 1924, that certain seasonal changes or rhythms observable in the physiology of man are due to a former need for hibernation in our human ancestors when subjected to the winters of the glacial period—by which he meant the recent or Pleistocene glacial period, when man existed. Apart from the extracts and statements given in your annotation, I know nothing of this report and its contents; but I should like to point out the strong resemblance of the views described to the hypothesis first put forward by myself in April, 1924, and later published (January, 1931) in extended form in my book "Seasonal Variation in Man." But I have never suggested the possibility of *human* hibernation, which, unless the term is used in a loose sense, would be out of the question. My thesis is that the heat-stable mammal, given suitable physical conditions, annually goes through a vestigial cycle, which is the analogue of the old hibernating cycle imposed on earlier heat-labile types of mammal during and after their stages of differentiation. In the book in question this conception will be found methodically reasoned out, and further deduced for the pathological field, where it is shown capable of explaining the existence and characters of certain morbid events in ourselves, and of providing, among other things, the theory of tetany. Among the physiological consequences the expectation of an uplift in reproductive efficiency in March–April, which was confirmed by me for this district, and other facts commented on in your article, such as seasonal weight and growth curves and the reversal in date of such changes in the southern hemisphere, are shown to follow from the same central assumption.

Since my hypothesis appears to have so great an interpretative force in physiology and medicine, and since at its first introduction in book form it received inadequate notice, I have now in course of preparation a further short account of it. Meanwhile it is interesting to learn that a contemporary has arrived, though from a different line of approach, at a view having this much of identity with my own.

I am, Sir, yours faithfully,

Liverpool, July 6th, 1933. EDMUND HUGHES.

THE CAREY COOMBS MEMORIAL

To the Editor of THE LANCET

SIR,—Many of the friends and patients of the late Dr. Carey Coombs have expressed the desire of establishing, in his memory, some form of permanent memorial. With this object in view a committee of eight have been appointed, representing the Bristol University, the British Medical Association, Bristol Medico-Chirurgical Society, and the Bristol General Hospital.

We (the members of this committee) have decided to collect funds for the purpose of this memorial, and would offer an early opportunity of contributing to the same. We are satisfied that whatever sum is raised, it will be possible to invest it in such a way as to keep Dr. Carey Coombs' name in perpetual remembrance. We may be able to endow a research studentship (an object very dear to Dr. Carey Coombs's heart) or a lectureship, associated with the Bristol University. The income of this sum will be given to Mrs. Carey Coombs for the next five years towards the education of her children.

Promises of support or cheques should be sent to Dr. Elwin Harris, Jun., 13, Lansdown-place, Clifton, the cheques crossed "Coombs' Memorial." It would be of great assistance to us if intending contributors would indicate to us as quickly as possible their intentions.

We are, Sir, yours faithfully,

ERNEST W. HEY GROVES,
President, Bristol Medico-Chirurgical Society (Chairman).
CLARE SMITH,
Committee of the Bristol General Hospital.
EDWARD FAWCETT,
Dean of Medical Faculty, Bristol University.
C. E. K. HERAPATH,
British Medical Association and Bristol Royal Infirmary.
S. MARLE,
Bath Division of British Medical Association.
C. A. MOORE,
Bristol General Hospital.
J. A. NIXON,
Professor of Medicine, Bristol University.
H. ELWIN HARRIS, Jun.,
Bristol Medico-Chirurgical Society (Secretary).

Clifton, July, 1933.

PELLAGRA AND INTESTINAL INFECTIONS

To the Editor of THE LANCET

SIR,—Your annotation on Pellagra in Denmark (June 24th) interests me because of the statement in it that chronic gastro-intestinal disease contributes to the causation of pellagra by impairing the absorption of food. In 1931 I published a note in which it was shown that the incidence of pellagra was markedly greater in patients suffering from intestinal schistosomiasis. Of 173 cases of pellagra, 117 had this intestinal infection—i.e., 67 per cent. compared

with a general percentage of intestinal schistosomiasis of 34·5. This fact was well illustrated in a family of three: father, son, and daughter. Father and son were suffering from pellagra and were infected with intestinal schistosomiasis, while the daughter was infected with urinary schistosomiasis and had no trace of pellagra. The three were living under the same conditions, taking the same diet with the only difference in their infection. Thirty-seven villages were investigated as regards the relation between pellagra and intestinal schistosomiasis. In most of them the incidence of pellagra followed the incidence of the intestinal infection. This also agrees with the fact that among the German prisoners of war in Egypt, 65 suffered from pellagra, and 63 of these were suffering from amœbic or bacillary dysentery.

I am, Sir, yours faithfully,

ASAAD FAKHRY, M.B. Cairo,
Medical Officer, Bilharzia and Ankylostoma
June 28th, 1933. Hospital, Damanhour, Egypt.

MEASURING A HEALING ULCER

To the Editor of THE LANCET

SIR,—I acknowledge the truth of Dr. Hill's correction; there is no logarithm of 0 and, theoretically, an ulcer should take for ever and a day before it heals. My point is that taking the logs of the areas at equal intervals of time, in practice we get a straight line, and the time when we may expect complete healing to have taken place is approximately when that line reaches the base line.

I am, Sir, yours faithfully,

Eastgate, Lincoln, July 8th, 1933. W. H. B. BROOK.

EXPERIMENTAL PRODUCTION OF MALIGNANT TUMOURS

To the Editor of THE LANCET

SIR,—In his protest against the one-sided treatment of cancer work by exponents of experimental research Mr. Sampson Handley expressed an opinion long held by those who study cancer as it exists in human beings. Obviously the prime object of both laboratory and clinical workers is to find an explanation of the causes and nature of cancer in man. Directly or indirectly both are making for the same end. It so happens that the whole of our knowledge of the structure, symptoms, diagnosis, and treatment of the neoplasias of man comes from those who approach this subject by direct, clinical methods. To this extensive knowledge the contribution of laboratory experimentalists is practically nil, all that they have done being the addition of a few scraps tending to support or confirm the work of clinicians and pathologists. Such being the case it is by no means easy to understand why those who may be experts on the subject of tumours of the lower animals should be chosen as judges or as assessors of evidence bearing on the subject of the neoplasias in man. As a rule an assessor is appointed because of his success and because of his freedom from prejudice; but no one in the possession of his senses could claim either of these qualifications for the experimentalists. What, for example, could be more convincing of the reality of the prejudice of which Mr. Sampson Handley complains, than the difference in the reception given to a book published by a laboratory researcher and a book written on the clinical aspects of cancer investigation, as reviewed in some leading journal by an exponent of research. The former is lauded to the skies as the work of a genius, a brilliant achievement which will bring the writer undying fame, or words to that effect. The latter, though the outcome, it may be, of many years of hard work, and obviously deserving serious and judicial attention, meets with a very different reception. In one such instance known to me this reception was far from being chilly, as is often the case, for the reviewer, chancing to see some paragraph not so laudatory of research as it might be, "went for" the book after the manner of a bull who sees blood. So little was the book reviewed and so much was the animus shown against it that some of those who read the "review" wrote to the author of the book suggesting that the reviewer must have been carried away by some personal antipathy. But such an explanation is of course out of the question. That which looked like petty spite was amply to be accounted for by the laboratory environment and the special training of the research worker. These are not of a nature to qualify the possessor to act as a judge of any article or book needing a spacious outlook. However accomplished a man may be as a worker and authority on the tumours of mice in a laboratory it is too much to expect that he should be able to take large or correct views of the nature and causes of the neoplasias which afflict humanity.

To correct the anomaly against which Mr. Sampson Handley protests and which others have experienced, may I suggest that those who still pin their faith to experimental work on lower animals should rank as authorities on their special subject, and that all other branches of oncology should be regarded as coming within the province of those who study the neoplasias of man.

I am, Sir, yours faithfully,

Reading, July 10th, 1933. HASTINGS GILFORD.

ENLARGEMENT OF ANCOATS HOSPITAL.—Extensions to this hospital costing £70,000 are nearing completion. There will be a four-storey block with 15 beds in each ward, two private wards on each of three floors, and one private ward on another floor. There is a large lecture theatre, and the pathological department is greatly improved. It will be necessary to add 40 bedrooms to the nurses' home at a cost of £8000.

HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET.—The foundation-stone of the new nurses' home, an imposing building in Guilford-street, of which the shell is already complete, was laid on July 7th by Princess Alice, Countess of Athlone, deputising for the Princess Royal. A group of children, chosen by ballot from among the young subscribers to the reconstruction fund, were on the platform and their names were inscribed on the stone. Lord MacMillan, chairman of the board of management, read a letter from the Princess Royal, who had worked as a nurse in the hospital during the war, deeply regretting that indisposition had prevented her visit. He said that it was considered only proper to start the process of rebuilding the hospital by making adequate provision for the nursing staff, who had hitherto suffered much inconvenience from lack of accommodation. Several nurses now had to share one room, but in future, when the new building was complete, each would have her own and would be able to lead a happy comfortable life in a charming home. The cost of this home was £70,000, of which £19,000 was still to seek. The nurses themselves had contributed £200, earning the money by doing jobs for each other. Sir Gerald du Maurier urged those present to induce their friends to raise money towards the completion of the reconstruction of the hospital, and Lady Galway spoke eloquently of the need for help. Princess Alice emphasised the fact that in the past far too little attention had been paid to the comfort of nurses. After Dr. F. J. Poynton, senior physician, and Mr. Tyrell Gray, senior surgeon, had thanked the Princess, she was conducted to view a typical bedroom and sister's sitting-room while the general company repaired to the hospital for tea.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Local Government Officers' Superannuation

IN the House of Commons on July 5th the Local Government and Other Officers' Superannuation (Temporary Provisions) Bill was considered on report. On Clause 3 (Determination of Questions arising under the Act), Sir HENRY JACKSON and Mr. ISAAC FOOT moved an amendment providing that disputes between parties as to whether a reduction in remuneration should be disregarded for the purposes of superannuation should be determined by the Minister, and not be referred to an arbitrator. He said that he thought they would get better uniformity than if the matters were dealt with by arbitration. Mr. SHAKESPEARE (Parliamentary Secretary to the Ministry of Health) said it would be far better to leave the clause as it stood, so that if the parties agreed the Minister would settle the case in dispute; but if they would prefer the appointment of an arbitrator that course could be adopted.

The amendment was withdrawn and the Bill was read the third time and passed.

Emergency Treatment of Road Accidents

Lord MOYNIHAN'S Road Traffic (Emergency Treatment) Bill was considered by a Select Committee of the House of Lords on July 6th. Lord IVEAGH presided.

Sir HENRY PIGGOTT (Deputy-Secretary, Ministry of Transport) giving evidence said that the Ministry was in sympathy with the general object of the measure, but the difficulty was to secure it without undesirable innovation in legal practice and without creating injustices in place of those which were removed. It ran against the established principles of jurisprudence to fasten on a man liability for which he might not be responsible. The witness thought that the liability imposed by the Bill was one against which the owner of the vehicle would have to insure under the Road Traffic Act.

Replying to Lord Moynihan the witness said that he saw no vital objection to an increase in the charge for a driving licence from 5*s.* to 7*s.* 6*d.* to form a fund out of which the hospitals and the doctors might be paid for emergency treatment. The fund would have to be administered by a board, but he did not see why its work should be expensive.

The committee adjourned.

Government Grants to Distressed Areas

On July 6th, on a vote of £440,000 for special grants to local authorities in distressed areas in England and Wales, Sir HILTON YOUNG (Minister of Health) said that the result of the long continuation of depression had been gradually to exhaust in the particular areas where the burden was heaviest, the resources or reserves which in ordinary times were available to cover any such increased expenses due to unemployment. The resources of the unemployed themselves and their families had been exhausted in the special areas. In addition, all those auxiliary resources of private help and charity, which were always such an invaluable background in our national life, had also been largely exhausted in those areas. The resources of the ratepayers in these areas had been diminished by the same causes as had operated against the reserves of the unemployed themselves. There were a certain number of authorities in the country who, owing to the increase of out-relief expenditure, were confronted with a very difficult situation which called for urgent and adequate relief during the coming year. The Government's scheme was a temporary one advanced simply to deal with the emergency of the present year. The permanent scheme would be introduced in the course of the present parliamentary session, but it could not be put forward in time to give the help that was required for the current year 1933–34.

The test whether an area was to receive a grant would be whether its expenditure on out-door relief was in excess of an equivalent of a 2*s.* rate for the area and the amount which a distressed area would receive would be in proportion to the amount of the excess expenditure on out-door relief over the amount which was equivalent to a 2*s.* rate. The average expenditure on out-door relief of all local authorities in the country as a whole was 1*s.* 3*d.* and the marginal 9*d.* above 1*s.* 3*d.* was thought a reasonable margin for two reasons: first, in order to secure that the relief available should go only to the most distressed areas; and second, because it was thought right that there should be some recognition of the responsibilities of local authorities for economy and good standards of administration.

Public Health Administration: Minister's Statement

BLOCK GRANTS

On July 7th, on a supplementary vote for the salaries and expenses of the Ministry of Health, Sir HILTON YOUNG said that the block grants to local authorities showed an increase of £195,000, due entirely to the new money which the House voted the other day for the second grant period in accordance with the original scheme under the Act of 1929. As a set off against that new money there were decreases of certain other grants owing to changes in the weighted population and alterations in boundaries. The actual vote for his department amounted to £19,000,000, a decrease of £135,800. The principal increase was an increase in housing grants of about £250,000. That amount would have been very much greater had it not been for the fact that Parliament had decreased the Wheatley subsidies, and all subsidies except those for slum clearance and rural reconditioning. As against the housing increase there was a decrease of £375,000 on the health insurance vote, due principally to the Act of 1932. It was also due to the fact that in 1932 the House had to vote £120,000 in respect of the influenza epidemic. As that epidemic had not recurred the expenditure on that head had not been necessary this year. There was a small decrease of £2800 in respect of the administration of his department. This was the result of a very big effort, because the staff of the Ministry of Health was constantly increasing on account of the expanding health services.

STERILISATION OF THE UNFIT

This, said Sir HILTON YOUNG, was a difficult problem. The Committee knew how enormous was the expense of the mental deficiency service; but more important was the great gravity of the disadvantage in our national life of mental deficiency. They also knew how uncertain was the public mind on the question of sterilisation. They had started an inquiry which would enable them to ascertain the facts, and he hoped that the committee undertaking the inquiry would be able to report before very long. The inquiry was not to pronounce on the question of policy. Only the House of Commons could do that when the nation's mind was more made up than it was at the present time. But the committee of inquiry would place the facts before the country in order that it might come to a sound judgment on this vital matter.

REFUSE DUMPS

Another matter in regard to which they had to look ahead was the accumulation of great masses of refuse round the great cities, London in particular. These refuse dumps were potential sources of danger to public health. He had set up a new consultative committee of the Corporation of London and the

28 borough councils to coördinate their interests to those of the localities where the refuse dumps were situated. As a result of this effort he hoped to see a great improvement in the future.

HOUSING

Last and most important in the work of planning and foresight was the actual work of town and country planning. The Act passed last year had given a great impetus to that work, and it was being pushed forward as rapidly as possible by the influence of the Ministry. The returns from local authorities in the principal urban areas showed that for the first five months of this year there had been a very substantial increase in the actual number of building plans passed. Last year the value of the plans passed during the first five months was £26,000,000, but this year the figure had gone up to £34,000,000. At present there was no diminution in the rate of construction of assisted houses. They were in a most interesting and critical period of the campaign against slums. He was encouraged by the spirit in which the work was being taken up by the local authorities, and he believed that the work was going well.

EFFECT OF DEPRESSION ON HEALTH

He thought they would expect to see the depressed condition of the country beginning to tell upon the health of the people. Certainly a Minister of Health must be on the alert for symptoms of that. In what he had to say he was not pretending that the people of the country were well off, and that all was for the best in this world. It was not; there was deprivation and nearness to the margin of life, due to bad times throughout the country, and all the distress which was caused thereby. But what he wanted to look at was the actual physical effect as shown in the statistics.

As the result of a widespread and close inquiry which he had been carrying on as to the state of the nation's health as a result of the depression it had been made quite clear that unemployment was undoubtedly telling upon the mental state of the unemployed, and producing states of mind which were unhealthy.

As to the physical health of the nation the Ministry of Health had, of course, sources of information far wider than could be available in any other inquiry. In 1932 the death-rate of the whole country was 12 per 1000, equal to the average rate from 1921 to 1930, and it had been steadily declining up to the present time. There was a very remarkable and most encouraging decrease in the death-rate among children. That was the proudest achievement of our health services in the last half century. Since 1910 the infant mortality-rate had been halved, a marvellous achievement for the new welfare services conducted with so much efficiency by the local authorities and the medical profession throughout the country. He found no evidence of increased morbidity in the country as a whole. In the case of such diseases as pneumonia and bronchitis the morbidity statistics were going down. But most important of all as a barometer of health and nutrition was tuberculosis, and there the figures showed that the death-rate per 1,000,000 from tuberculosis in all forms fell in 1932 to 838 from 896 in 1931. There was a particularly marked fall in the incidence and mortality from non-pulmonary tuberculosis, which was the child's particular form of the disease.

MATERNAL MORTALITY

But while the statistics of infant mortality might be their pride those of maternal mortality were undoubtedly a matter for dissatisfaction. Certainly the Ministry was not content with them. The maternal mortality-rate last year was 4·11, and this year it was 4·21. The first part of the work in dealing with this situation must be the better education of the mother and of the midwife. In the meantime they were continuing the constant pressure on local authorities to raise the standard of the maternity services. He was delighted to know that the number of infant welfare centres was increasing, and that the antenatal clinics were conspicuously increasing. They had increased by 250 between 1931 and 1933.

MALNUTRITION

He had seen all the reports of medical officers of health and regional medical officers on the actual state of the physical health of the country and of the unemployed in special relation to the question of malnutrition. A general summary of those reports was that the health of the country was normal in spite of the depression. He had good reports in particular from London, Lancashire, Birmingham, Liverpool, and the North Riding of Yorkshire.

There was one matter which deserved the attention of the local authorities. When they were looking for a place in the family where malnutrition would show itself as a result of unemployment and depression they should look at the woman. It was beyond the power of any man to prevent a mother depriving herself for the sake of her children, and this placed upon them a responsibility in such times as the present to watch the health of the mothers of the country.

Views of Medical Members

Sir FRANCIS FREMANTLE appealed to the Ministry to bring town planning more into line with housing; proper planning for the part of a town associated with slum clearance should be insisted on before any clearance scheme was embarked on. He thought it mistaken policy for pensioners who had exhausted their rights under the National Health Insurance scheme to be obliged to leave their panel doctor and to go to a poor-law doctor; was it not possible, he asked, to fuse the two schemes in the provision of medical benefit? Surely one medical man should be able to look after the interests of all the members of one family. He went on to ask for signs of the promised coöperation between voluntary and other hospitals under the Act of 1929. In some places things were working well, especially where membership of the local authority was largely the same as that of the agencies running the voluntary hospitals, but he hoped pressure would be brought to bear elsewhere to make coöperation effective. He alluded to a feeling of grievance in the nursing profession; nurses who moved from a voluntary to a municipal hospital or vice versa now lost their pension rights. He deprecated the compartment system under which a local authority had different sets of officials to manage the various branches of the health services. He would like the Ministry to urge on the General Medical Council the fact that in medical training far too much attention was being paid to the treatment of disease and far too little to its prevention. Outside the medical profession the enormous value of physical education was being increasingly appreciated, and he wanted the Ministry to give more consideration to the positive side of health promotion.

Dr. O'DONOVAN said it was fitting for a practising physician to say how much the medical profession appreciated the selfless devotion to duty over many years of Sir George Newman. He could not agree with Sir Francis that practising doctors were not concerned with preventive medicine. The Minister of Health would not be where he was but for years of persuasion and agitation on the part of the clinical profession. The whole practice of medicine, in fact, was soaked in prevention, and when the two branches of medicine came to realise that they had but one aim and one object the friction between them would cease. He spoke of the increase in the number of hospital beds as an indication of the failure of hospitals to conserve health, and pointed to the development of out-patient departments staffed by highly trained physicians as an object more worthy of the Minister's care. The infant welfare centres arising in abundance were only 90 per cent. efficient; they served as nets for sorting out the sick and the fit, difficult cases when they arose being sent to voluntary hospitals for diagnosis and treatment. Here again the consultants of London and other great urban centres were adding the touch of efficiency which made these

centres worth while. As there was a whole army carrying on the public services in connexion with the preventive side of medicine, he did not think that welfare centres could claim as their own the whole of the great drop in child mortality. Finally, he expressed the hope that medical officers of health would be given facilities for going freely to professional meetings and discussing matters that affected the public health with the clinicians who were as closely concerned.

LAPSE OF MEDICAL BENEFIT

Replying later to points raised in debate, Mr. SHAKESPEARE (Parliamentary Secretary to the Ministry of Health) said that having looked into the facts again in regard to those people who would fall out of medical benefit in December he was convinced that they had been exceptionally generously treated. He thought that the case made on their behalf did not stand investigation. The Health Insurance Fund was self-supporting, but, if that fund was to be debauched, as the Unemployment Insurance Fund had been debauched, then the whole structure would be undermined. These men, or some of them, in the extreme cases, had been kept in insurance since 1920. Every year since that date they had been entitled to cash benefits and to all the rights of an ordinary insured person, yet they had not paid one penny in contributions. In other words, they had had 13 years free insurance as regarded sickness benefits, they would have 14 years' free insurance as regarded medical benefits, and 2 years more as regarded pensions. Surely these men had been generously treated. It was said that it was hard on the doctors to lose 80,000 panel patients, but every year there were 150,000 new persons coming on to the panel. But if the question was only one of the choice of doctor, and a local authority submitted some sort of system whereby the district medical officers who were also panel practitioners might attend these men and the men have choice of doctors, then he was sure that the Minister of Health would consider it.

Bills Dropped.

Among the private members' Bills which have been dropped by their promoters are the Nurses Registration Act (1919) Amendment Bill and the Registration and Regulation of Osteopaths Bill.

HOUSE OF COMMONS

THURSDAY, JULY 6TH

Casuals: Sleeping Arrangements

Mr. PRICE asked the Minister of Health whether he was aware that thousands of casuals were locked up each night in solitary cells from 6 P.M. to 6 A.M.; and whether he would make an order that the doors of sleeping cells should be left unlocked.—Sir E. HILTON YOUNG replied: No, Sir. All the information available goes to show that it is not now the normal rule to lock cubicles at night. It would, however, be impracticable, and in my opinion undesirable, to make a rule that in no circumstances should cubicles be kept locked.

Discharges from Mental Hospitals

Mr. JOHN asked the Minister of Health whether, in view of the annual increase of 1900 in the mental hospital population and the resulting strain on accommodation, he would request the Board of Control, in compliance with the recommendation of the Royal Commission, to compile and circulate a pamphlet setting forth the rights of the public in matters of which they were now ignorant, notably the right to apply under Section 79 to the visiting committee for the discharge of patients to the care of friends.—Sir E. HILTON YOUNG replied: I am not satisfied that it is necessary to prepare the pamphlet suggested. The situation as regards Section 79 has already been met by the existing rule which requires the managers of every institution, on the admission of every rate-aided person, to send a notice embodying the substance of that section to all persons who are named as relatives or friends of the patient in the statement of particulars accompanying the reception order.

Glucose in Jam

Captain BALFOUR asked the Minister of Health upon what grounds his department was opposed to the inclusion of glucose in jam; and in what particulars glucose fell short of the accepted standards for foodstuffs.—Sir E. HILTON YOUNG replied: I am advised that there is no public health objection to the use of pure glucose as a foodstuff. It is, however, generally considered that jam is better made with cane sugar and that if made with glucose it is not so good. My view is, therefore, that notice of any such substitution should be given to the purchaser.

MONDAY, JULY 10TH

Milk and Cream Prices

Captain PETER MACDONALD asked the Minister of Agriculture how the average prices of milk and cream in this country had been affected by the recent restrictions on foreign imported process milk.—Major ELLIOT replied: The arrangements governing the imports of processed milks were made in order to avoid a market collapse, to provide room for large and increasing stocks in the hands of home manufacturers, and to enable manufacturers to keep their processing plants in operation. I understand that these objects have very generally been achieved, and while it is not possible to estimate the effect on the prices of milk and cream, the arrangements are having a marked effect in supporting the liquid milk market at a time when it is at its weakest owing to the seasonal peak of production.

Dental Treatment by Education Authorities

Captain HEILGERS asked the Parliamentary Secretary to the Board of Education whether he would consider advising authorities to institute a voluntary contributory scheme, on the lines of the hospital contributory schemes, for all dental treatment supplied by the education authorities.—Mr. HERWALD RAMSBOTHAM replied: My noble friend is considering proposals on the lines indicated which have been submitted to him on behalf of one local education authority. But he is bound to have regard to the existing statutory position under which local education authorities are required to make arrangements for dental treatment subject to a charge in those cases, and in those cases only, in which treatment is actually provided; and he feels some doubt whether the proposals will be found to be consistent with that position.

TUESDAY, JULY 11TH

Air Ambulance Service in Scotland

Mr. KIRKWOOD asked the Secretary of State for Scotland what were the practical difficulties in the way of organising an air-ambulance service for the conveyance of urgent medical and surgical cases to the hospitals and infirmaries in Glasgow; and whether he would make arrangements to enable an aeroplane to be hired in case of urgent need.—Mr. SKELTON (Under-Secretary of State for Scotland) replied: The extent to which aeroplanes could be used for the conveyance of medical and surgical cases in the Highlands and Islands area is limited in the first place by the fact that suitable landing places are not available in many of the islands, and except in fine weather conditions the maintenance of an aeroplane or seaplane service may not at all times be practicable. In the second place any arrangements that might be made with a company or organisation for the maintenance of an air-ambulance service would require to include the reservation of a number of aeroplanes for use on requisition, but the uncertainty as to whether, owing to the unfavourable conditions which I have mentioned, these aeroplanes could in fact be used on any given occasion would make the payment of a subsidy for the maintenance of the service a somewhat doubtful use of public money. The policy of the Department of Health in the administration of the Highlands and Islands (Medical Service) Fund has been to encourage the development of a local hospital service with skilled surgeons for the treatment of both urgent and other cases. If, however, pending the develop-

ment of such a local service in any district it were found that the practical difficulties in the way of maintaining an air-ambulance service would be overcome, my right hon. friend would be very glad to coöperate with any organisation who would undertake the local arrangements for the transport of urgent cases by aeroplane or seaplane to the nearest available hospital.

Temperature in Mines

Mr. TINKER asked the Secretary for Mines if his attention had been drawn to the high temperature prevailing in some of the mines, and that the men working in them suffered in health in consequence of the heat and were unable to work the full time the colliery was open for employment; and if he would have inquiries made with a view of putting in the forthcoming Mines Bill what the maximum temperature should be for the men to work in.—Mr. ERNEST BROWN replied: No representations have been made to me, but the very difficult problem of reducing the high wet bulb temperatures which naturally exist in some of the deeper mine workings is constantly being dealt with by the managers of such workings and the inspectors. I am advised that while work under such conditions is fatiguing it is not usually a cause of ill-health. The deep mining of coal in this country must necessarily extend in years to come, and for this reason the development of ameliorative measures is being continuously studied, both in its medical and practical aspects, by the Hot and Deep Mines Committee which coöperate with the Safety in Mines Research Board.

Voluntary Patients in Mental Hospitals

Mr. TURTON asked the Minister of Health how many cases had been brought to his notice during the last 12 months of voluntary patients being lodged in the same ward or room in a mental institution, hospital, nursing home, or place approved by the Board of Control, under Section 1 of the Mental Treatment Act, 1930, as certified patients; and whether he would circularise local authorities and other persons in charge of such institutions, hospitals, or places, regarding the undesirability of such an arrangement.—Mr. SHAKESPEARE (Parliamentary Secretary to the Ministry of Health) replied: One case has been brought to the notice of my right hon. friend in which this matter was the subject of complaint. That case was investigated, and it did not appear that there was any substantial ground for complaint. The classification of mental patients has to be based mainly on their condition and symptoms, and it is not necessarily desirable to provide separate accommodation for voluntary patients, even if it were possible to do so in the present stage of shortage of bed accommodation. My right hon. friend is advised that the present arrangements are generally as satisfactory as is practicable in the circumstances, and the number of voluntary patients is steadily increasing. He does not think it would be advisable to adopt the suggestion in the last part of the question.

WESTMORLAND SANATORIUM.—At this sanatorium and home for consumptives at Meathop, Grange-over-Sands, a new pavilion for 20 patients costing £4000, has been erected to take the place of two-bedded "pagoda" shelters, and has been opened by Dr. W. L. Paget-Tomlinson, the president. The pavilion, which is of stone and faces almost due south, has double and single wards and a full-length verandah. Most of the beds are rented by various northern local authorities which pay £110 per annum per bed.

WRIGHTINGTON NON-PULMONARY TUBERCULOSIS HOSPITAL.—Sir George Newman recently opened this institution of the Lancashire county council. Its core is Wrightington Hall, near Wigan, which was purchased some years ago for £16,500. Its adaptation and the erection of pavilions have cost a further £114,720—£621 per bed, towards which the Ministry of Health has contributed £180. There is accommodation in five one-storey pavilions and an isolation block for 126 adults and 100 children. The buildings stand in beautiful grounds 300 feet above sea-level; the hall itself provides for most of the nursing staff.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. to be Surg. Capts.: G. G. Vickery, J. H. Burdett, W. Bradbury, and E. MacEwan.

Surg. Lts. (D) to be Surg. Lt.-Comdrs. (D): H. A. Ginn, G. B. F. Reece, H. V. Pell, and L. V. Donegan.

The following appointments are notified: Surg. Capts. J. H. Burdett to *Victory* for Haslar Hospital, and C. V. Griffiths to *President* as Deputy to Medical Director-General of the Navy.

Surg. Comdr. F. G. Hunt to *Pembroke* for Chatham Hospital.

Surg. Lt.-Comdrs. E. T. S. Rudd to *Achilles*, J. V. Williams to *Pembroke* for Chatham Barracks, and G. Rorison to *Pembroke* for Chatham Barracks.

Surg. Lts. H. J. Bennett to *Sandhurst* and P. N. Taylor-Walker to *Dorsetshire*.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Comdr. T. B. Dixon to be Surg. Capt.

Surg. Lt.-Comdrs. F. L. Cassidi and S. W. Davidson to be Surg. Comdrs.

ROYAL ARMY MEDICAL CORPS

Maj. E. A. Tozer relinquishes his temp. commn. and retains the rank of Maj.

Lt. W. A. Y. Knight to be Capt.

TERRITORIAL ARMY

Col. P. H. Mitchiner, K.H.S., from unemployed list, to comd. 13th (4th Lond.) Gen. Hosp.

Lt.-Col. and Bt. Col. J. Wallace retires on completion of tenure of appt. and retains his rank, with permission to wear the precribed uniform.

Capt. and Bt. Maj. D. Ross to be Maj.

Capt. P. Hayes, from T.A. Res. of Off. (Gen. List, R.A.M.C.), to be Capt.

Lts. D. A. McM. Crawford, F. W. Crook, and F. W. A. Warren to be Capts.

D. M. Mitchell to be Lt.

Supernumerary for service with O.T.C.: Lt. J. R. Wheeler resigns his commn.

INDIAN MEDICAL SERVICE

Lt.-Col. C. I. Brierley, C.I.E., to be Col.

ROYAL AIR FORCE

Flying Officer O. M. Fraser is promoted to the rank of Flight Lt.

RESERVE OF AIR FORCE OFFICERS

Flight Lt. (Hon. Squadron Leader) T. M. Walker is employed with the Regular Air Force for a further year.

AUXILIARY AIR FORCE

D. A. Smith is granted a commission as Flying Officer No. 607 (County of Durham) (Bomber) Squadron.

COLONIAL MEDICAL SERVICE

In Northern Rhodesia Dr. H. S. de Boer, Deputy Director of Sanitary Services, has been appointed Deputy Director of Medical Services; and Dr. A. Kinghorn, Deputy Director of Medical Services, Director of Medical Services. Dr. E. C. Smith has been promoted to Senior Pathologist, Nigeria.

INDEX TO "THE LANCET," VOL. I., 1933

THE Index and Title-page to Vol. I., 1933, which was completed with the issue of June 24th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

BEIT MEMORIAL TRUST FOR MEDICAL RESEARCH

NEW PROFESSORIAL FELLOWSHIP

A MEETING of the Trustees of the Beit Memorial Fellowships for Medical Research was held on July 11th, 1933, for the election of Fellows and other business.

The annual report states that Fellowships during the present year were held by 25 workers, this number including one special Fellowship of £1000 in tropical medicine.

Among the distinctions gained during last year by past Beit Fellows the Trustees record the election of Mr. A. S. Parkes, D.Sc., to the Fellowship of the Royal Society, he being the fifth who has now received that honour. Prof. D. T. Harris has been appointed to the Chair of Physiology at the London Hospital, and Prof. I. de Burgh Daly to the Chair of Physiology in Edinburgh University. Mr. G. F. Marrian, D.Sc., was awarded the W. J. Mickle Fellowship of the University of London for 1932, in sequence to another Beit Fellow, Mr. P. Eggleton, D.Sc., in 1931.

The Trustees propose to exercise their power (after the expiration of 20 years from the creation of the Trust in 1909) to alter the regulations for award of Fellowships. In view of the far greater opportunities now available for maintaining junior men in medical research work, it is less difficult than it used to be for a young man of true ability to find an entrance to such work. But the long devotion of a lifetime is often needed, and that cannot be expected unless to the ablest of the juniors a path is opened to senior posts where research may still be the chief pursuit.

The Beit Fellows who worked in the subjects ancillary to medicine have easily found places in which they could continue for life a career of research combined with teaching. Out of the total of 102 men who have completed the tenure of a Fellowship since the first election in 1910, 22 have received full professorships in various universities. But it has been difficult for a man to remain in clinical research after the relatively short tenure of a Beit Fellowship. There was scant hope in this direction of any reasonably paid appointment in maturer life, and sooner or later he would have to pass either into the general diagnostic work of consulting practice or to a laboratory life remote from immediate contact with patients.

The Trustees state that experience has shown unmistakably that medicine may look for practical advances at least as soon as from those engaged in clinical research as from the pure laboratory worker. It is no disadvantage that the research worker should bear responsibility for the treatment of the sick; their needs will concentrate his thoughts upon urgent problems of disease. Only it is essential that his mind should focus all its energies upon the chosen problem, and that it should be spared the dissipation of effort in the countless directions of clinical experience which on the other hand form the best training for the good diagnostician. Medicine has thus gained greatly from the sustained researches of Sir Thomas Lewis on disorders of the heart and of Prof. E. Mellanby on rickets, two of the very first Beit Fellows. But the opportunities to continue to full fruition the work that they had chosen came later through the policy deliberately adopted by the Medical Research Council that all possible assistance should be given to some senior men for the prosecution of research bearing directly on clinical problems. The Council has maintained one full-time senior post for such clinical research, held by Sir Thomas Lewis since 1916, providing a position equivalent to that of a university professor with assistants and laboratory facilities, but also with direct control of a number of hospital beds where studies could be made of some chosen form of disease. Last year the Rockefeller Foundation gave permanent endowment of the post at University College Hospital, and so enabled the Council to create a second post elsewhere. The Beit Trustees have now resolved to add a third by creating a Professorial Fellowship which may be held at some medical centre in Great Britain where adequate facilities for work can be provided.

This Professorial Fellowship will be of tenure similar to that of a university chair, and the salary will absorb those of four or even five junior Fellowships. It will not be required that the holder of the post shall have previously been elected to an ordinary Beit Fellowship. The present announcement of policy will not be followed immediately by an appointment to the post.

The following elections to Fellowships were made :—

Senior Fellowship

CUTHBERT LESLIE COPE, D.M. Oxf., M.R.C.P. To continue his work on the excretion of non-threshold substances and of sugars in nephritis. At the Medical Unit, St. Thomas's Hospital, London.

Fourth Year Fellowships

JOHN MCMICHAEL, M.B. Edin., M.R.C.P. To continue his researches on enlargement of the spleen in human disease and its relationship to diseases of the liver. At the Medical Unit, University College Hospital, London.

GEORGE NORMAN MYERS, M.D. Durh., Ph.D. Camb. To continue his work on biochemical changes in hearts of guinea-pigs poisoned by diphtheria toxin and also on the production of active immunity through the slow absorption of oil emulsions of bacterial toxins. At the Pharmacological Laboratory, University of Cambridge.

CHARLES AMOS ASHFORD, M.A., Ph.D. Camb. To continue his studies of the utilisation of carbohydrate by brain tissue. At the Dunn Institute of Biochemistry, University of Cambridge.

FREDERICK HORACE SMIRK, M.D. Manch., M.R.C.P. To continue his studies on water diuresis and the formation of œdema fluid, and to develop his urinary test for early renal damage in man. At the Medical Unit, University College Hospital, London.

Junior Fellowships

ARTHUR SPROUL MCFARLANE, M.B., M.A. Glasg. Biochemist to the Glasgow Royal Cancer Hospital since 1931. Proposed research: Physico-chemical nature of protein solutions and of suspensions of bacteria by measurement of the light scattering capacity and of the sedimentation velocity in the field of the ultracentrifuge. At the Institute for Physical Chemistry, The University, Upsala, Sweden.

ERIC STEPHEN HORNING, D.Sc. Melbourne, B.A. Oxf. Cytologist to Cancer Research Committee, University of Sydney, N.S.W., since 1928. Proposed research: To investigate by micro-incineration the relative distribution of the inorganic radicles of normal and tumour cells that have been exposed to various types of radiation. At the Laboratory of the Imperial Cancer Research Fund, Queen-square, London.

WILLIAM JOHN DANN, B.Sc. Shef., Ph.D. Camb. Grocers' Research Scholar, 1932. Proposed research: The transmission of food vitamins by milk and the placenta, and the possible function of ascorbic acid (vitamin C) in oxidation mechanisms of the cell. At the Nutritional Laboratory, University of Cambridge.

BRIAN GILMORE MAEGRAITH, M.B. Adelaide, B.Sc. Oxf. House Physician, Adelaide Hospital, 1931. Proposed research: Methods of diagnosis and treatment of cerebro-spinal meningitis. At the Dunn School of Pathology, University of Oxford.

PHILIP JOCELYN GEORGE MANN, B.Sc. Birm. Working with grants from Department of Scientific and Industrial Research since 1931. Proposed research: Functions of peroxidase as being chiefly an anabolic enzyme, and the action of vitamin B as a possible co-enzyme of the lactic dehydrogenase system. At the Dunn Institute of Biochemistry, University of Cambridge.

MAURICE STACEY, B.Sc., Ph.D. Birm. Demonstrator in Chemistry, University of Birmingham, 1929-32. Proposed research: Investigation of carbohydrates yielded in the growth of moulds and of bacteria. At the Department of Biochemistry, London School of Hygiene and Tropical Medicine.

ARTHUR HENRY HUGHES, B.A. Camb. Research Student, Department of Colloid Science, Cambridge. Proposed research: Reactions in surface films of molecules of biological importance, dealing in particular with hæmoglobin and the enzymes responsible for snake venom hæmolysis. At the Department of Colloid Science, University of Cambridge.

ALISON SARAH DALE, B.A. Camb. George Henry Lewis Student. Proposed research: Processes underlying the staircase phenomenon in amphibian and mammalian hearts. At the Pharmacological Laboratory, University of Edinburgh.

The value of a Senior Fellowship is £700 per annum, of a Fourth Year Fellowship £500 per annum, and of a Junior Fellowship £400 per annum.

All correspondence of Fellows and candidates should be addressed to Prof. T. R. Elliott, M.D., F.R.S., Honorary Secretary, University College Hospital Medical School, London, W.C. 1.

MEDICAL NEWS

University of Liverpool

At recent examinations the following candidates were successful:—

M.D.

E. T. Baker-Bates, A. B. Follows, W. W. Gerrard, B. T. J. Glover, J. H. Hughes, T. L. Hughes, and E. L. Rubin.

FINAL EXAMINATION FOR M.B. AND CH.B.

Part I. (1929 *Regulations*).—W. M. Beattie, A. C. Brewer, A. Cohen, G. V. Craine, Phillis Dingle, V. K. Drennan, B. J. Green, R. L. Hartley, Mary M. Hurst, G. E. Jones, Joan G. Jones, J. R. Jones, E. W. Knowles, H. S. Lanceley, Ethna W. Little, Sheelah Little, F. R. Neubert, W. Parke, J. Pinkerton, J. G. Rogers, W. I. D. Scott, A. R. Sibbald, and E. G. Watson.

Part A (1924 *Regulations*).—J. Morgan and T. H. Pierce.

Part II. (1929 *Regulations*).—A. B. Concanon, Bessie Dodd, Jannett C. Evans, F. A. Frank, F. Harrison, E. W. Jones, J. R. Jones, A. O. Karstaedt, Kathleen M. Kavanagh, A. J. McCall, Annie A. Merrick, L. Millward, Margaret F. Proctor, W. I. D. Scott, S. Shulman, A. Speight, S. L. Strange, R. P. Tong, J. K. B. Waddington, M. M. Wallis, and Margaret C. Winter.

D.P.H.

Part II.—P. L. C. Carrier, P. P. Fox, and D. O. Hughes.

D.M.R.E.

Part B.—J. R. Burrows and T. P. Twomey.

Among awards of fellowships and scholarships are the following:—John W. Garrett international fellowship in bacteriology: Dr. E. R. Jones. Robert Gee fellowship in human anatomy: Dr. A. S. Kerr. Holt fellowships: physiology, Dr. G. R. Griffith; pathology, Dr. G. A. C. Lynch. Lady Jones research fellowship in orthopædic surgery: Dr. W. S. Creer. John Rankin fellowship in anatomy: Dr. W. Bullock. Thelwall Thomas fellowship in surgical pathology: Dr. H. G. Hanley. Samuels memorial scholarships: medicine, Dr. J. Libman; surgery, Dr. M. Silverstone; and obstetrics and gynæcology, Dr. T. N. A. Jeffcoate. Owen T. Williams prize: Dr. J. D. Hay.

University of Manchester

At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR M.B., CH.B.

Second-class Honours.—T. F. Heslop (distinction in Medicine).

Pass.—Wilfrid Bradley, T. W. Brindle, Edna Circuitt, R. K. Clough, Eli Davis, P. R. Evans, W. G. H. Hughes, J. F. E. Johnson, Raymond Judson, A. R. Kennedy, Nathan Launer, J. C. Morris, Roland Nightingale, H. C. Palin, D. C. Racker, Florence C. Read, Louis Rich, Walter Sagar, John Schofield, Nathan Shlosberg, J. N. Strauss, Eric Vernon (distinction in Obstetrics), C. S. Walker, and J. L. D. Williams.

DIPLOMA IN PSYCHOLOGICAL MEDICINE

Part II.—H. A. Palmer.

On July 8th women graduates celebrated the jubilee of the admission of women to Owens College on the same terms as men. To mark the occasion the University conferred three honorary degrees, and the recipients included Miss Harriette Chick, of the division of nutrition at the Lister Institute, London, who was made D.Sc.

University of Sheffield

At recent examinations the following candidates were successful:—

M.D.

Constance N. Jenkinson.

FINAL EXAMINATION FOR M.B., CH.B. (PART II.)

F. R. P. O'Hara-Proud (with Second-class Honours), Labib Botros, R. M. Edelman, Ursula S. Nutt, S. J. Rabinowitz, Frederick Rodgers, and D. C. Waddy.

Royal College of Surgeons of Edinburgh

The following have been granted the diploma of L.D.S.:—

Mara V. R. American, Alexander Buchan, G. A. Rowse, S. T. J. Abell, J. D. Trayner, T. C. A. Wilson, T. W. Harrison, and Allan Law.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the Faculty on July 3rd, Dr. James Kerr Love, Prof. Grafton Elliot Smith, M.D. (in absentia), and Sir Malcolm Watson, M.D., were admitted honorary Fellows. Dr. Alexander Arthur Charteris (Glasgow) and Dr. Veekatasubbu Iswariah were admitted to the Fellowship.

University of Durham

On June 27th the following degrees and diplomas were conferred:—

M.D.—Isaac Bainbridge, Leonard Barber, B. N. Bhandari, E. C. Brewis, J. L. Burn, Stanislaus Curry, W. L. Fulthorpe, John Giles, J. A. Lennox, D. C. Livingston, John Maddison, A. J. Moskow, T. W. Stallybrass, and S. C. Stonier.

M.S.—G. Y. Feggetter.

M.B., B.S.—W. G. H. Allen, R. A. Blaiklock, A. G. Bowerbank, A. T. Burn, T. M. Clayton, J. S. Coad, Thomas Cocks, S. Y. Feggetter, G. A. Flann, A. N. Graham, H. C. Lawson, R. P. Leake, H. P. McNamara, T. F. Main, Samuel Mark, May F. St. J. U. Millar, Laura M. Redhead, Edwin Scott, G. A. Sharpe, and T. E. M. Wardill.

B. Hy.—Muriel Brighton, J. L. Burn, R. H. Clayton, W. L. M. Gabriel, Gavin Millar, and J. B. Tilley.

D.P.H.—Muriel Brighton, J. L. Burn, R. H. Clayton, W. L. M. Gabriel, Gavin Millar, and J. B. Tilley.

University of Dublin

At recent examinations in the School of Physic, Trinity College, the following candidates were successful:—

M.D.

S. A. Clark, N. M'I. Falkiner, Marie A. Hadden, and Hope Trant.

M.CH.

P. A. Hall.

FINAL EXAMINATION FOR M.B., B.CH., AND B.A.O.

Therapeutics and Pathology.—*W. A. Gillespie, D. S. Quill, Harold Pringle, H. J. Anderson, G. W. Patterson, R. L. Oakes, Maurice Marmelstein, J. R. Kellett, R. H. Pratt, Joseph Sorett, William Charney, and J. R. M'Elroy.

Medicine.—*Emily M. Booth, D. M. Mitchell, H. D. Clarke, M. J. Horgan, H. R. Davies, D. M. Ahern, W. H. E. M'Kee, J. S. M. Pringle, E. C. Rowlette, Marjorie R. E. Boyd, H. S. Barber, Esther C. L. Howe, W. P. Griffin, Norman Jackson, M. J. Roberts, J. S. Ruddell, E. S. A. Ashe, James Bell, Ethel S. Wilson, Mary J. Ahern, G. S. S. Harty, J. K. Lavery, Agnes Monteiro, C. W. N. Smiley, Emanuel Howitt, Una M. Irvine, Eileen M. Kennedy, I. T. F. Wiley, T. J. M. Gregg, and Alphonsus Dolphin.

Surgery.—*D. M. Mitchell, M. J. Horgan, D. M. Ahern, Emily M. Booth, H. D. Clarke, H. S. Barber, H. R. Davies, Marjorie R. E. Boyd, Ethel S. Wilson, W. P. Griffin, J. K. Lavery, W. A. Clarke, H. S. Perrot, Eileen M. Kennedy, C. W. N. Smiley, J. S. Ruddell, M. J. Roberts, E. C. Rowlette, W. T. Bermingham, Una M. Irvine, and H. T. Ryan.

Midwifery.—E. E. O'Malley, Mary E. Mansfield, Helena G. G. Bennett, Ethel S. Wilson, Sheila K. Henderson, M. H. Cosbie, and B. E. W. Aldwell.

*Passed on high marks.

D.P.H.

Part II.—(*Old Regulations*): Frances E. O'Connor. (*New Regulations*): Marjorie L. Campbell, E. S. Duthie, W. E. Holmes, C. H. Adderley, J. V. Ryan, and A. A. Lisney.

DIPLOMA IN GYNÆCOLOGY AND OBSTETRICS

M. M. El Hennawy and Victor Enok.

University of Aberdeen

On July 5th the honorary degree of LL.D. was conferred on W. J. Mayo, chief of staff of the Mayo Clinic, Rochester, U.S.A.

The following degrees were also conferred :—

M.D.—•J. B. Ewen, •D. C. Robb, •R. D. Stuart, •Robert Sutherland, J. A. Dawson, R. H. G. H. Denham, and R. G. Henderson.

•Awarded Commendation for Thesis.

M.B., Ch.B.—†I. A. Anderson (with First-class Honours); A. M. Rennie and J. R. S. Third (with Second-class Honours); G. W. F. Anderson, R. G. S. Bain, F. J. S. Bowman, J. A. Cameron, Charles Cockburn, H. D. Collins, C. A. Cromar, R. A. Cumming, W. J. L. Dean, William Hay, G. R. E. Kerr, James Ledingham, †G. P. Merson, M. McL. M. Morrison, H. F. Park, J. F. Philip, P. C. Wallace, and J. C. Wilson.

† Passed Final Medical Professional Examination with Distinction.

D.P.H.—S. A. B. Black, A. R. Forrest, J. S. B. Mackay, G. D. McKenzie, J. D. Trail, J. S. Walker, and James Webster.

University of Bristol

On the occasion of the centenary celebrations of the University of Bristol the following honorary degrees were conferred: *LL.D.*—Lord Dawson of Penn, Sir Holburt Waring, Sir Norman Walker, and Sir Frank Colyer. *D.Sc.*—Emeritus Professor E. W. Hey Groves. *M.D.*—Prof. Miles H. Phillips. Prof. G. Elliot Smith, Prof. A. V. Hill, and Prof. R. Muir, who were unable to be present at the ceremony, will have honorary degrees conferred upon them at a later date.

Miss D. M. Stone, M.D., has been appointed junior pathologist in the department of preventive medicine.

A Medical Tour of German Spas

At the invitation of a group of German spas a number of members of the medical profession will be visiting Germany at the beginning of August. The tour will last about ten days and the itinerary will include Bad Nauheim, Bad Wildungen, and a trip on the Rhine. The visitors will become guests of the spas when they reach the German border. Particulars may be had from Mr. Robert O. Rohme, 90, Sheaveshill-avenue, Colindale, London, N.W.9, who is making the arrangements.

Medical Oarsmen

One of the events at the St. Dunstan's regatta, which was held on July 12th at Putney, was a race between a four of old blues and a crew of men blinded in the war. The old blues four, which was gathered together by Mr. Malcolm Donaldson, F.R.C.S., was to consist of himself, Sir Harold Gillies, F.R.C.S., Dr. J. S. Burn, and Dr. E. N. Showell-Rogers, with Dr. R. Knox as cox. Dr. Knox was in the Oxford boat in 1925, but it is stated that none of the others has done any rowing for 25 years.

Royal College of Surgeons of England

Election to the Council.—On July 6th five Fellows were elected into the council to fill the vacancies occasioned by the retirement in rotation of Lord Moynihan, Sir John Lynn-Thomas, Mr. A. H. Burgess, and Mr. V. Warren Low, and by the death of Sir Percy Sargent. The result of the poll was as follows :—

	Votes.	Plumpers.
Sir Charles Gordon-Watson ..	785	29
Arthur Henry Burgess	773	12
Henry Sessions Souttar ..	579	24
Reginald Cheyne Elmslie ..	553	8
Leonard Ralph Braithwaite ..	547	28
Charles Max Page	527	8
Claude Howard Stanley Frankau	444	24
Cyril Alfred Rankin Nitch ..	439	4
Duncan Campbell Lloyd Fitzwilliams	415	27
Alfred William Sheen ..	384	3

In all 1420 Fellows voted, including 253 Fellows resident out of Great Britain and Ireland; in addition, 8 votes were found to be invalid. Mr. Braithwaite becomes substitute member of council for Lord Moynihan until 1935. Mr. Elmslie becomes substitute member of council for the late Sir Percy Sargent until 1938. Sir Charles Gordon-Watson, Mr. Burgess, and Mr. Souttar are elected for the full period of eight years.

International League against Rheumatism

The fourth congress of the Ligue Internationale Contre le Rhumatisme will take place at Moscow from May 3rd to 6th, 1934. The following subjects are to be treated: rheumatic fever in its different expressions; the indications for balneotherapy in different forms of rheumatism; and rheumatic morbid conditions in transport-workers, mine-workers, and metal-workers. During the congress there will be an exhibition, and afterwards members will be enabled to visit the different sanatoria and spas in the Caucasus and on the Black Sea. For further information apply to the Bureau of the Ligue, Keizersgracht 489, Amsterdam.

Society for Relief of Widows and Orphans of Medical Men

At a quarterly court of directors, held on July 5th, Dr. W. H. Kelson, a vice-president, being in the chair, half-yearly grants to widows and orphans to the amount of £1430 were voted from ordinary funds and £600 from the Brickwell fund, as well as special grants of £129 18*s*., making a total of £2159 18*s*. At the present time there are 52 widows and 5 orphans in receipt of relief. The death was reported of a widow who came on the funds in 1904 and had received in relief £2100; her late husband had paid in subscriptions £52 10*s*. Membership is open to any registered medical man who at the time of his election is residing within a 20-mile radius of Charing Cross. Relief is granted only to the necessitous widows and orphans of deceased members of the society. Full particulars from the secretary at the offices of the society, 11, Chandos-street, London, W.1.

Papworth Village Settlement

A large meeting of the supporters of the Papworth Settlement was held on Thursday, July 6th, at the Park Lane Hotel under the chairmanship of the Earl of Harewood. A satisfactory year's work was recorded, and Lord Harewood was able to state that the institution was benefiting more patients than ever before and finding employment for more tuberculous subjects than any similar institution, while he added that no child born in Papworth had as yet developed tuberculosis as far as the records had been ascertainable. It was announced that Mr. Baldwin, Sir Louis Baron, and Mr. Warwick Deeping had been elected vice-presidents of the Settlement, as a fitting acknowledgement of their generous assistance. For Mr. Baldwin's broadcast speech on behalf of the Settlement had produced directly and indirectly a very large sum of money, Sir Louis Baron and his co-trustees were giving £20,000 in five yearly instalments towards the erection of the new Bernhard Baron Memorial Hospital, while Mr. Warwick Deeping, who had described Papworth village in one of his novels, had given to the Settlement a share of royalties which had already produced nearly £1000. In seconding the adoption of the report an excellent speech was made by Dame Agnes Hunt, when describing the plight of the convalescent tuberculous employee, who cannot secure re-engagement by his firm because of the attitude of the other workmen. The public fear she described as fatal to the future of these unfortunate cases, and formed a powerful argument for the immediate foundation of settlements on Papworth lines where tuberculous subjects could have medical supervision and could earn their livelihood with self-respect and help to support the sheltering institution. Lady Linlithgow, in thanking Lord Harewood for presiding, alluded to the strong personal interest which had been taken by the Royal Family in the welfare of Papworth, and suggested that as the company was meeting on the fortieth anniversary of the wedding of the King and Queen a telegram of loyal congratulations should be sent to them from the meeting. This being unanimously agreed to, the vote of thanks was seconded by Sir Pendrill Varrier-Jones, who spoke optimistically of the work that lay ahead of the Settlement and of the general movement for instituting similar settlements as money was forthcoming, for the problem of the care of the tuberculous was, he maintained, largely an economical one. At the close of the meeting a short film was presented showing how life is spent at Papworth.

Elizabeth Garrett Anderson Hospital

Last week Lady Kindersley opened a new pathological department at this hospital. It has been reconstructed from an old building given some time ago to the institution.

The National Institute for the Deaf

The annual meeting of supporters of the institute was held on Thursday, July 6th, at Church House, Westminster, Lord Charnwood, the president, being in the chair. Speaking to the annual report the chairman pointed out that at last their work was receiving Government recognition, the issue by the Ministry of Health of a sympathetic circular leading to the hope that the plight of the victims of deafness would in the near future receive consideration as their difficulties became known. A research, put in hand by the medical committee of the institute, had led, he said, to definite improvements in electrical aids, under which not only many subjects could be assisted, but scientific methods may be arrived at for the cultivation of residual deafness, an infliction which is still met by haphazard methods. The report having been adopted a resolution was passed by the meeting welcoming the action already taken by the Ministry of Health and asking the Government to set up a permanent advisory committee to watch over the interests of the deaf as is done in the case of the blind.

Construction and Maintenance of Institutions

Sir Hilton Young, the Minister of Health, has appointed a Departmental Committee whose terms of reference are :—

To consider and report on the questions of the capital cost of construction and the annual cost of maintenance of the following classes of public buildings provided by local authorities—viz., hospitals (including mental hospitals), public assistance institutions, mental deficiency institutions, maternity homes (including maternity departments newly constructed or added to hospitals) and baths and wash-houses, special regard being paid to (*a*) the establishment and periodic revision of standards ; (*b*) modern methods of construction ; and (*c*) the possibility of securing a reduction in present costs without impairing the efficiency of the buildings for the purposes for which they are designed.

The committee is appointed in pursuance of a recommendation made by the Committee on Local Expenditure in their report of October, 1932, and in accordance with the announcement made in the Minister's Circular 1311 of March 22nd, 1933. The chairman is Sir L. Amherst Selby-Bigge, and the members Mr. J. Allcock, F.I.M.T.A., Mr. N. B. Batterbury, Mr. H. W. Bruce, F.R.C.S., Mr. R. C. Cox, M.Inst.C.E., Dr. J. Ferguson, Mr. J. Kirkland, F.R.I.B.A., Dr. T. S. McIntosh, Mr. R. H. P. Orde, Mr. L. G. Pearson, F.R.I.B.A., Mr. A. Scott, F.R.I.B.A., and Dr. W. Rees Thomas. The secretary will be Mr. J. Topping, of the Ministry of Health, to whom communications should be addressed.

International Society of Orthopædic Surgery

As has already been announced, the second congress of this society will be held from July 19th–22nd at the house of the Royal Society of Medicine, 1, Wimpole-street, London, W. The president, Prof. Nové-Josserand (Lyons) will receive members at the Langham Hotel, Portland-place, at 9 P.M., on July 19th, and on the next morning will give an address on the Orientation of Orthopædics. This will be followed by a discussion on the mechanism of articular movements in general, to be opened by Prof. H. von Bayer (Heidelberg), Prof. F. Delitala (Venice), Dr. R. Scherb (Zurich), and Prof. E. Kopits (Budapest). On July 21st in the morning the treatment of tuberculous hip disease will be discussed. The opening speeches will be given by Prof. J. Erlacher (Graz), Prof. A. Maffei (Brussels), Dr. M. S. Henderson (director of orthopædic surgery at the Mayo Clinic, Rochester), and Prof. E. Sorrel (Strasbourg), followed by Prof. J. Hass (Vienna), Dr. M. Inclan (Havana), and Prof. Nové-Josserand and Prof. L. Bérard (Lyons). On July 22nd short papers will be read by Dr. Willis Campbell (Memphis, Tennessee), Dr. Lasserre (Bordeaux), Dr. Lorenz Böhler (Vienna), Prof. A. Steindler (Iowa), Dr. Minar (Ljubljana), Dr. W. Stern (Cleveland), and Dr. Valls (Buenos Ayres). The afternoons will be devoted to demonstrations of operations in various hospital theatres. An extensive social programme has been arranged, including a banquet at the Dorchester Hotel, Park-lane, on July 21st.

The Star and Garter Home for Disabled Sailors and Soldiers

At the end of 1932 there were 238 patients, of whom 179 were at Richmond and the remainder at Sandgate ; there is still a waiting-list. The average weekly cost per patient was £3 8*s.* 9*d.* The Ministry of Pensions grant was £15,767 ; legacies produced £3297, and donations and subscriptions £461, a small increase.

Birmingham Convalescent Home

On July 1st Sir Charles Hyde formally opened the Birmingham Hospital Saturday Fund's new convalescent home for women at Kewstoke, Weston-super-Mare. The building, which has cost £60,000 and has 100 beds, is the seventh convalescent home belonging to the fund. It occupies a commanding position at the end of the beautiful Kewstoke Woods, overlooking Sand Bay, two miles from Weston. Last year 6113 patients passed through the Fund's convalescent homes. Recently 415 women subscribers were waiting for admission while only 44 could be taken weekly. The opening of the new home will increase the weekly total by 50.

West London Medico-Chirurgical Society

Dr. Julius Burnford presided at the annual banquet held at the Trocadero Restaurant on July 6th. The Dean of St. Paul's, proposing the toast of the Society, gratefully contrasted the excellent fare provided with the menu of cod-liver oil, rice with the husks on, lemon juice with lettuce, with lumps of fat as a final course, which might have been expected at a gathering of progressive doctors. His comparison between the birth-rate and death-rate in India with those of this country led him to prophesy a distressing outlook for the medical profession here, since their patients would neither be born nor die. The President, in reply, recalled the names of the men who founded and supported the society 30 years ago, notably C. R. B. Keetley, H. Percy Dunn, Phineas Abraham. The subjects chosen by the Cavendish lecturers of the society year by year showed a perception of the large issues that medicine would be called upon to face, often long in advance of professional opinion elsewhere. Dr. W. S. C. Copeman, senior secretary, proposed the Guests, making graceful allusion to their distinction in various fields. Lord Justice Slesser in reply suggested that the misunderstanding which sometimes arose between the medical and legal professions might be due to the fact that lawyers worked down from general to particular, whereas doctors worked up from particular to general. Sir Holburt Waring, another guest, spoke of the pioneer work in post-graduate education undertaken at the West London Hospital, and expressed his conviction that there was room in London for more than two post-graduate schools. Mr. B. A. Levinson proposed the health of the President, who briefly replied.

Births, Marriages, and Deaths

BIRTHS

BOSTON.—On July 5th, at St. Mark's House, Regent's Park-road, N.W., the wife of F. K. Boston, M.B., of a son.

COLDREY.—On July 7th, at Chatham House, Rotherham, the wife of Eric Coldrey, M.D. Lond., F.R.C.S. Eng., of a son.

SACKS.—On July 9th, at Mapesbury-road, N.W., the wife (M. E. Landau, M.D., F.R.C.S.) of Dr. S. Sacks, of a son.

MARRIAGES

GREEN—HINDE.—On July 8th, at Holy Trinity Church, Street, Somerset, Francis H. K. Green, M.D., M.R.C.P., to Elsie Joyce, only daughter of Mr. and Mrs. Karl Hinde, of Rosewood-street, Somerset.

LANE—KINGSTON.—On July 8th, at St. Mary's Church, Dover, Sydney C. H. Lane, M.B., B.S., M.R.C.S., of Deal, to Gladys Margaret, daughter of the late Mr. and Mrs. C. R. Kingston, of Bombay.

DEATHS

GIBBS.—On July 7th, at St. Mawes, Alfred Napier Godby Gibbs, M.R.C.S., L.R.C.P. Lond., Honorary Consulting Surgeon to the Bristol Eye Hospital.

STEVENSON.—On July 2nd, at his home, Ford House, Churchinford, Chard, Somerset, William Dymes Stevenson, M.R.C.S., Physician and Surgeon, aged 72.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

EUGENICS SOCIETY.

TUESDAY, July 18th.—5.30 P.M. (at the Royal Society, Burlington House, Piccadilly, W.), Mr. A. M. Ludovici: Eugenics and Consanguineous Marriages.

INTERNATIONAL SOCIETY OF ORTHOPÆDICS.

WEDNESDAY, July 19th, and three following days, Congress at 1, Wimpole-street, W.

INTERNATIONAL PÆDIATRIC CONFERENCE.

THURSDAY, July 20th, and two following days, at the B.M.A. House, Tavistock-square, W.C.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

MONDAY, July 17th, to SATURDAY, July 22nd.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Broad-street. Course in Ophthalmology, afternoons and evenings, Mon., Wed., and Thurs.—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars-road. Course in Dermatology, every afternoon.—HOSPITAL FOR CONSUMPTION, Brompton. Course in Practical Pathology, on Mon. and Thurs., 11.30 A.M. to 1 P.M.—ALL SAINTS' HOSPITAL, Austral-street, West-square. Course in Urology, afternoons and some evenings.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith-road, W.

MONDAY, July 17th.—10 A.M., Medical and Surgical Wards, Skin Clinic. 2 P.M., Gynæcological and Eye Clinics, Surgical Wards.

TUESDAY.—10 A.M., Medical Wards. 11 A.M., Surgical Demonstration. 2 P.M., Throat, Nose, and Ear Clinic. 4.15 P.M., Mr. Green-Armytage: Pelvic Inflammation.

WEDNESDAY.—10 A.M., Medical and Children's Wards. Children's Clinic. 2 P.M., Eye Clinic. 3.45 P.M., Venereal Disease Demonstration.

THURSDAY.—10 A.M., Neurological and Gynæcological Clinics. 11 A.M., Fracture Demonstration. 2 P.M., Eye and Genito-urinary Clinics.

FRIDAY.—10 A.M., Skin Clinic. 12 noon, lecture on Treatment. 2 P.M., Throat, Nose, and Ear Clinic.

SATURDAY.—10 A.M., Medical and Surgical Wards, Children's Clinic.

DAILY.—2 P.M., Operations, Medical and Surgical Clinics. The Demonstrations at 4.15 P.M., are open to all Medical Practitioners without fee.

Appointments

THOMSON, K. C. P., M.B., Ch.B. Edin., has been appointed Junior Resident Surgeon, General Hospital, Barbados, B.W.I.

YOUNG, J. BRUCE, M.D. Edin., M.R.C.P. Lond., Assistant Physician to St. Mary's Hospital for Women and Children, Plaistow.

Certifying Surgeons under the Factory and Workshop Acts: AITKEN, J. B., M.B., Ch.B. Edin. (Colne District of Lancaster); LIST, H. M., L.R.C.P. Lond., M.R.C.S. (Stone, Stafford); MACEWAN, W. S., M.B., Ch.B. Edin. (Tranent, East Lothian); MOORE, J. Y., L.R.C.P. Lond., M.R.C.S. (Sawston, Cambridge).

Vacancies

For further information refer to the advertisement columns

Aberdeen Royal Mental Hospital.—Jun. Asst. Physician. £300.
Aylesbury, Royal Buckinghamshire Hospital.—Res. M.O. At rate of £200.
Banbury, Oxon, Horton General Hospital.—Res. M.O. At rate of £150.
Bangor, Carnarvonshire and Anglesey Infirmary.—Sen. and Jun. H.S. £150 and £100 respectively.
Barry U.D.C. Surgical Hospital.—H.S. At rate of £200.
Bath, Royal United Hospital.—H.P. At rate of £175.
Beckenham, Kent, Bethlem Hospital, Monk's Orchard.—Res. H.P. At rate of £150.
Birmingham and Midland Eye Hospital, Church-street.—H.S. £130–£150. Also Asst. Surgeon.
Blackburn Royal Infirmary.—Res. H.P. £175. Also Fourth H.S. £150.
Bradford Children's Hospital.—Hon. Physician.
Bradford Royal Infirmary.—Two H.S.'s. Each at rate of £135.
Brentwood, Essex, High Wood Hospital for Children.—H.P. £80.
Burnley Municipal General Hospital.—Jun. Res. M.O. £150.
Cardiff City.—M.O.H. £1200.
Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £150.
Derby, Walton Sanatorium, nr. Chesterfield.—Locum Res. Asst. M.O. At rate of £350.
Dorchester, Dorset County Hospital.—H.S. At rate of £160.
Eastbourne, Princess Alice Memorial Hospital.—Res. H.S. At rate of £150.
Evelina Hospital for Sick Children, Southwark, S.E.—H.S. At rate of £125.
Exeter, Royal Devon and Exeter Hospital.—H.S. At rate of £150.
Gloucester Royal Infirmary and Eye Institution.—H.S. At rate of £150.
Gravesend and North Kent Hospital.—Two H.S.'s. Each £125.
Great Yarmouth General Hospital.—H.S. £140.
Greenock Royal Infirmary.—Two H.S.'s. Each at rate of £100.
Hammersmith Hospital, Ducane-road, Shepherd's Bush, W.—Asst. M.O. £350.
Hertford County Hospital.—H.P. At rate of £150.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.P. At rate of £100.
Hull Royal Infirmary.—H.P. for Sutton Branch. At rate of £160. Also Cas. O. and H.S. to Ophth. and Ear, Nose and Throat Dept. Each at rate of £150.
Ilford, Borough.—Asst. M.O. £500.
Ilford, King George Hospital.—Hon. Surgeon to Ear, Nose and Throat Dept.
Lambeth Hospital, Brook-street, Kennington, S.E.—Temporary Res. Asst. M.O. At rate of £250.
Lewisham Hospital, High-street, Lewisham, S.E.—Asst. M.O. £350. Also H.P. £80.
Liverpool Hahnemann Hospital, Hope-street.—Stipendiary M.O. At rate of £125.
Liverpool, Royal Children's Hospital.—Two Res. H.P.'s and Two Res. H.S.'s for City Branch, Myrtle-street. Each at rate of £100. Also Res. M.O. and Res. Surg. O. for Heswall Branch. At rate of £120.
Maidstone, Kent County Ophthalmic and Aural Hospital.—Ophth. H.S. At rate of £200.
Manchester, Ancoats Hospital.—H.P. At rate of £100.
Manchester, Christie Hospital and Holt Radium Institute, Withington.—Asst. Radiologist to Radium Inst. £500.
Manchester Northern Hospital, Park-place.—Sen. and Jun. H.S.'s. £130 and £100 respectively.
Manchester University.—Demonstrator in Human Physiology. £300.
Marie Curie Hospital, 2, Fitzjohn's-avenue, Hampstead.—Anæsthetist.
National Hospital, Queen-square, W.C.—Asst. Pathologist. £250.
North Wales, Pendyffryn Hall, Penmaenmawr.—Res. Asst. P. £250.
Nottingham General Hospital.—Two H.S.'s. Each at rate of £150.
Oswestry, Shropshire Orthopædic Hospital, &c.—Two H.S.'s. Each at rate of £200.
Oxford, Wingfield-Morris Orthopædic Hospital, Headington.—H.S. £100.
Plymouth, South Devon and East Cornwall Hospital.—Res. Anæsthetist and H.S. to Spec. Depts. At rate of £120.
Prince of Wales's General Hospital, N.—Hon. Physician to the Skin Dept.
Prison Medical Service.—M.O. £505 7*s*.
Queen's Hospital for Children, Hackney-road, E.—H.S. and Cas. O. Each at rate of £100.
Radcliffe-on-Trent, Notts County Mental Hospital.—Second Asst. M.O. £509.
Redhill, Surrey, Royal Earlswood Institution.—Jun. Asst. M.O. At rate of £250.
Royal Air Force.—Commissions.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Surgeon for Out-patients.
St. Andrew's Hospital, Devons-road, Bow, E.—Temporary Res. Asst. M.O. At rate of £250.
St. Giles's Hospital, Brunswick-square, Camberwell, S.E.—Clin. Asst. At rate of £100.
St. Helens Hospital.—Jun. H.S. £150.
St. John's Hospital, Lewisham, S.E.—Res. H.P., H.S., and Cas. O. Each £100.
Scarborough, Dr. Smart's Home.—Master.
Sheffield, Children's Hospital.—H.S. At rate of £100.
Sheffield Radium Centre, Royal Infirmary.—Asst. M.O. £300.
Shrewsbury, Royal Salop Infirmary.—Res. H.P. At rate of £160.
Southampton, Royal South Hants and Southampton Hospital.—H.P. At rate of £150.
South London Hospital for Women, Clapham Common, S.W.—Clin. Assts.
South Shields, Ingham Infirmary.—Sen. and Jun. H.S.'s. At rate of £200 and £150 respectively.
Stockport Infirmary.—H.P. £150.
Swanley, Kent, Alexandra Hospital for Children with Hip Disease. Res. Asst. M.O. At rate of £200.
Truro, Royal Cornwall Infirmary.—H.S. £170.
University of London, King's College, Strand, W.C.—Part-time Demonstrator. £150.
Warrington Infirmary and Dispensary.—H.P. At rate of £150.
Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.
West End Hospital for Nervous Diseases, Welbeck-street, W.—Jun. H.P. At rate of £100.
West London Hospital, Hammersmith-road, W.—Hon. Med. Reg. to Children's Dept. Also Res. Anæsthetist. At rate of £100.
Wigan Royal Infirmary.—H.S. At rate of £150.
Wolverhampton Royal Hospital.—H.S. to Ear, Throat and Nose Dept. At rate of £100.
Woolwich and District War Memorial Hospital, Shooters-hill, S.E.—Res. M.O. £175.
York County Hospital.—H.S. to Eye, Ear, Nose and Throat Dept. £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Southport, Lancaster; Faringdon, Berks; and at Cruden, Aberdeen.

NOTES, COMMENTS, AND ABSTRACTS

NATIONAL HEALTH INSURANCE MEDICAL SERVICE: AN OUTLINE

By R. W. Harris

CHAIRMAN OF THE MEDICAL SERVICE SUBCOMMITTEE OF THE LONDON INSURANCE COMMITTEE; FORMERLY AN ASSISTANT SECRETARY IN THE MINISTRY OF HEALTH

THE National Health Insurance scheme completes the first 21 years of its operation on July 15th. Many—by no means all—of the practitioners engaged in the insurance medical service have a good working knowledge of the scheme as a whole. For other practitioners and for students an outline of the character of the scheme and the principal features of the medical benefit provisions may be of interest. The statements in this very brief article are necessarily subject to many varying conditions and modifications, and the reader must turn elsewhere for a closer and more complete account of the National Health Insurance scheme.

The central health insurance fund is made up of the proceeds of the sale of weekly health insurance stamps which the employers affix to contribution cards, together with the interest on accumulations and grants from the national exchequer towards the cost of benefits actually distributed. The fund as a whole is distributed amongst bodies known as approved societies (which every insured person is expected to join) according to the number of their insured members. A sum is however retained in the insurance fund sufficient to cover, amongst other amounts, the yearly payments to doctors; this sum is distributed amongst the county and county borough insurance committees specially created under the Act to administer medical benefit. These committees in turn distribute the local fund amongst the practitioners according to the number of insured persons for whom they are severally responsible.

The rate of payment of the medical practitioner has been settled by regulation from time to time, and at present stands at 9*s*. for each insured person for whom he is responsible, with a temporary cut, voluntarily accepted by the profession, during the present financial emergency. The actual payment to the practitioner is not, however, ascertained by counting heads on his list and multiplying by 9*s*., as owing to day-to-day movements of population this number can never be accurate. The payment—as has been explained above—is a proportion of a central fund where a fairly accurate count of the total insured population is possible. There are in Great Britain about 15,000 insurance practitioners and 15,000,000 insured persons.

The principal features of the medical service are as follows:—

(1) The service is a general practitioner service (excluding confinements).

(2) Every insured person (which means the great majority of employed persons) is entitled to the service wherever he may be in Great Britain.

(3) Every qualified medical practitioner is entitled to put his name on the medical list (the "panel") and to take part in the service.

(4) Free choice of doctor by patient and of patient by doctor is possible within limits.

(5) Prescriptions are dispensed by pharmacists.

(6) Certificates of incapacity for work are issued to enable the insured person to draw cash payments during illness.

(7) The doctor is paid by a quarterly cheque representing a capitation fee for each insured person on his list, well or ill; consequently there is no fee-charging or account-keeping.

(8) The scheme is under central and local administrative control; the medical profession is closely consulted and is given a share in the various branches of the administration.

The "panel doctor," as he is known to the layman, has a great responsibility for the principal cash benefits which are paid weekly during the sickness or disablement of the insured person, as the overwhelming majority of these payments are in effect made on the doctor's certificate alone. There is machinery whereby medical officers of the Ministry of Health, acting as referees on the question of incapacity for work, may override the expressed opinion of the panel doctor. In the machinery which exists for checking loose or careless certification—as in the case of checks on wasteful prescribing—the members of the profession themselves play an important part.

The panel doctor is required to treat without payment every applicant who represents that he is an insured person, with certain safeguards where the applicant is not in possession of his medical card—that is, the voucher which he should always have with him showing that he is an insured person entitled to medical benefit. Fee-charging, except within narrow limits, is sternly discountenanced, the doctors as a whole being in effect under a contract for regular quarterly payments to give treatment to the whole insured population.

Complaints against insurance practitioners are investigated by a subcommittee of the insurance committee known as the medical service subcommittee, composed of an equal number of insurance practitioners and representatives of insured persons, with an independent chairman. In the main the cases investigated fall within the following categories: (*a*) charging fees to insured persons; (*b*) failure to visit patients or other forms of negligence; (*c*) irregularities in certification; (*d*) failure to keep records. Findings of fact by the medical service subcommittee are final. There is a right of appeal to the Minister of Health on the committee's recommendation which, if a breach of the regulations is established, commonly takes the form of a decision to withhold a part of the doctor's pay, the sum varying generally from £5 to £20, though smaller or substantially larger sums are occasionally withheld.

Removal from the panel can only be accomplished after an exhaustive inquiry by a special tribunal, and the decision whether or no to dismiss the practitioner rests with the Minister. Cases where practitioners are so removed are few in number and usually involve grave or persistent failure to provide proper treatment, or personal misconduct of such a character as to bring the service into disrepute.

In conclusion, it may be noted that the general interests of the insurance practitioner are looked after, locally, by a panel committee in each area exclusively representative of the insurance practitioners themselves, and, centrally, by the Insurance Acts Committee of the British Medical Association. The regulations made from time to time by the Minister of Health show that, in the exercise of his powers under the Acts, the Minister, especially where professional questions on disciplinary action are concerned, is relying more and more on the coöperation of the members of the medical profession.

NATIONAL COUNCIL FOR MENTAL HYGIENE

THE opening announcement in the ninth annual report of this council is that Prince George has accepted the first presidency. The report reviews the activities of 1932, in the course of which the council has been concerned with many aspects of mental health. Its committees have studied nervous instability in school-life, cyclothymia, the sterilisation of the unfit, the report of the Persistent Offenders Committee, and the care of mental disorders in municipal hospitals. The third biennial conference is to be held towards the end of this year, and in September there will be a European Mental Hygiene

Reunion in Rome. The journal, *Mental Hygiene*, has now become a regular publication appearing twice yearly, although the cost of producing it has more than once come from private pockets. The council hope to turn it into a quarterly and to publish in it not only the usual series of public lectures but also the papers read at the biennial conferences. The mental hygiene lectures during the year under review were exceptionally popular, and the council also, in coöperation with the British Social Hygiene Council, gave some very successful film lectures on marriage problems and sex education. The council has achieved its ambition of extending its work to the provinces, and stands have been taken at various health exhibitions and lectures given at a number of centres. A panel of lecturers has been drawn up, and application for them may be made by any society interested. Another new departure of the council is the formation of a small library, free to members; this is at present housed in the Institute of Medical Psychology.

DAIRY CATTLE AND DAIRY PRODUCTS

AN inquiry into the composition of milk as produced under conditions characteristic of the South of England has been made at the National Institute for Research in Dairying, Reading, and is described in the annual report.

The following figures were collected over a period of four complete years from a typical herd of nine shorthorn cows: interval between calvings, 13 months; lactation period, 280 days; yield of milk, 9047 lb. per cow; butter fat, 3·9 per cent.; solids-not-fat, 8·9 per cent. The butter fat in the morning's milking on 13·7 per cent. of occasions fell below 3 per cent., whilst the lowest sample ever recorded in the evening's milking was 3·6 per cent.

For two years data have been collected from six counties—Berkshire, Buckingham, Dorset, Hampshire, Northampton, and Oxford—on the causes of removal of cows from dairy herds, covering over 13,000 animals in all. The average productive life of a cow from these statistics appears to be four years. The percentage of the various causes of disposal or death of cows is as follows: sterility, 25·9; low milk yield, 17·7; tuberculosis, Johne's disease and "wasting," 12·3; trade, 14·1; udder troubles, 6·5; tuberculin test, 5·5; miscellaneous causes (calving troubles, &c.), 4·8; sundry disease (pneumonia, &c.), 4·5; old age, 4; abortion, 2·9; accidents (injuries), 1·8.

Traces of heavy metals in dairy products.—It has been shown at the institute that traces of copper and iron, which may be taken up by milk during the various processing methods, often have a pernicious influence on the flavour of the milk or milk products. If the Cu exceeds 1·5 parts per 1,000,000, an oily taint will rapidly develop in the milk, and its keeping qualities will be diminished. Butter or dried milk may suffer similarly from traces of Cu. Cu is the most potent of the metals tested, Fe, Mn, Ni, and Cr have a lesser influence, while Sn and Al appear to have no deleterious effect either on flavour or on keeping qualities.

Variations in vitamin content of milk.—Seasonal variations in the vitamin content of the milk of the typical herd have been investigated.

The year was divided into three periods in which the animals were fed under different conditions: (1) spring and summer (pasture) feeding; (2) autumn (intermediate) feeding; and (3) winter (stall) feeding. It was found that both vitamins A and D showed a marked rise in summer and autumn, the curve for D having a sharper peak and falling more rapidly in autumn than that for A. The determination of vitamin A by the chemical ($SbCl_3$) test is interfered with by an unidentified substance present in butter which also undergoes a marked seasonal variation, but may be removed by previous saponification of the butter. The D factor in butter behaves differently from other antirachitic substances (irradiated ergosterol and cod-liver oil) in being apparently, destroyed by saponification of the butter.

The importance of *milk control schemes* and a bonus system by payment according to the quality of the raw milk is shown by the very great improvement in the results when the two systems work together. In 1927, for example, in one series of farms only 14 per cent. of the milk reached Certified and 38·5 per cent. reached Grade A standards. In 1932, after these systems had been in force, the figures had risen to 65 per cent. and 94·8 per cent. respectively. The same is true of pasteurised milk also—e.g., in one case an average keeping quality of the bottled product of 5·3 units (1 unit = 6 hours at 60° F.) was raised after two months' supervision to 10·2 units.

The viability of the bovine tubercle bacillus in soil and dung exposed on a bare pasture to full sunlight has been studied. Organisms recovered from these pastures proved virulent to guinea-pigs (by inoculation) even after exposure for six months in 1931, a cold wet summer, and for five months in 1932, when spells of great heat were experienced. Growing grass, infected by spraying through the fine nozzle of a watering-can, remain infective when tested in the same way for at least 49 days even after a rainfall of 6¼ inches. But guinea-pigs kept in the open, and actually feeding on the heavily infected grass, failed to develop tuberculosis even after 13 months.

IDENTIFICATION BY THE TEETH

IT is recorded that when the body of Charles the Bold was found after the battle of Nancy, divested of his clothes and armour, it was unrecognisable but was identified by the fact that he had lost some of his lower front teeth. Since then there have been many instances of identification by teeth or their absence. The classical example in the story of crime is that of Parkman and Webster in 1849. Webster forgot that a platinum and gold denture would withstand the heat of the furnace in which he burned his victim. The dental school of Santiago owes its foundation to the gratitude of the Chilean government for the discovery of a dentist who proved that a murdered body was not that of his patient, the consul of a great European power. Mr. B. H. Humble reviews these and other historical instances of identification by means of teeth in the *British Dental Journal* of May 15th, and declares his belief that this method will become of increasing importance. Sometimes the thoughtless burglar takes a bite out of some convenient piece of food and omits to erase his toothmarks with the care which he would naturally apply to his finger-prints. Mr. Humble illustrates a piece of cheese which secured the conviction of a burglar at Cumberland Assizes in Carlisle in 1906. Other criminals bite their victims, and the dental impression thus left may be a means of identification long after the victim's death. In several criminal cases on the continent the dental evidence has been material in securing conviction. It seems very doubtful, however, whether the law of this country would allow the prosecution to take a dental impression from an accused person. Mr. Humble points out that the number of people receiving dental treatment is steadily increasing. Already about one-fifth of all elementary school-children pass through the dentist's hands and over 12 million insured persons in Great Britain are now eligible for dental benefit. Many dentists keep accurate records, and under insurance and school dental schemes these records are compulsory. There must, therefore, in the future be a steadily increasing number of people who could be identified by their teeth. In London during 1927 there were 74 dead bodies which remained unidentified, and this number is about the average. Mr. Humble suggests that a dental surgeon should be called in to such cases, and the complete description of the teeth should then be published in dental journals in the hope that identification may be made by a dentist. A description of this kind was recently published in the *Zeitschrift für Stomatologie*, and a writer in that journal has suggested that each dentist should be given a personal stamp so that his prosthetic work could be immediately recognised.